

PROGRAMMABLE
DIGITAL STORAGE OSCILLOSCOPE

DCS-8200

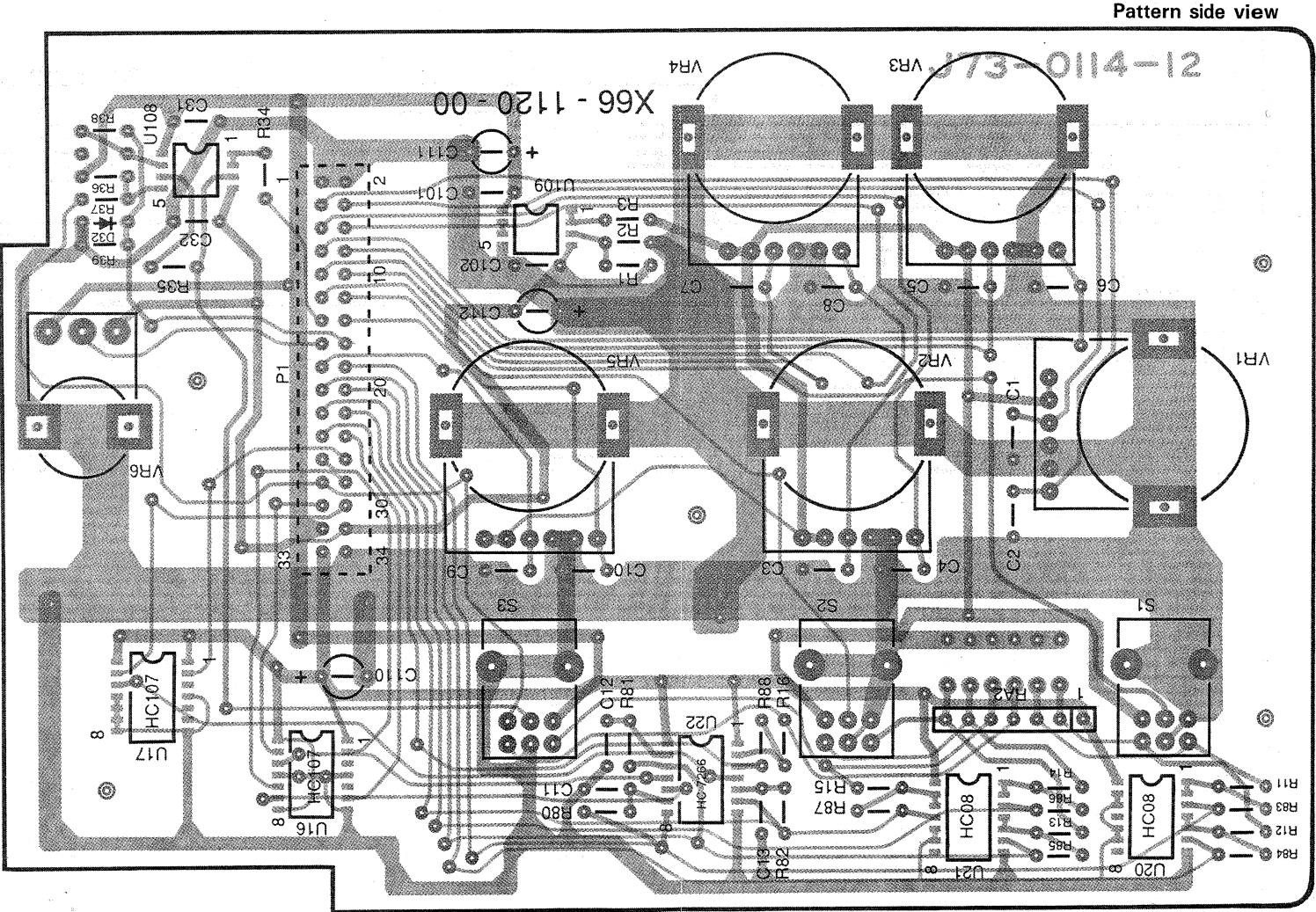
SERVICE MANUAL

(TEMPORARY VERSION)

KENWOOD CORPORATION

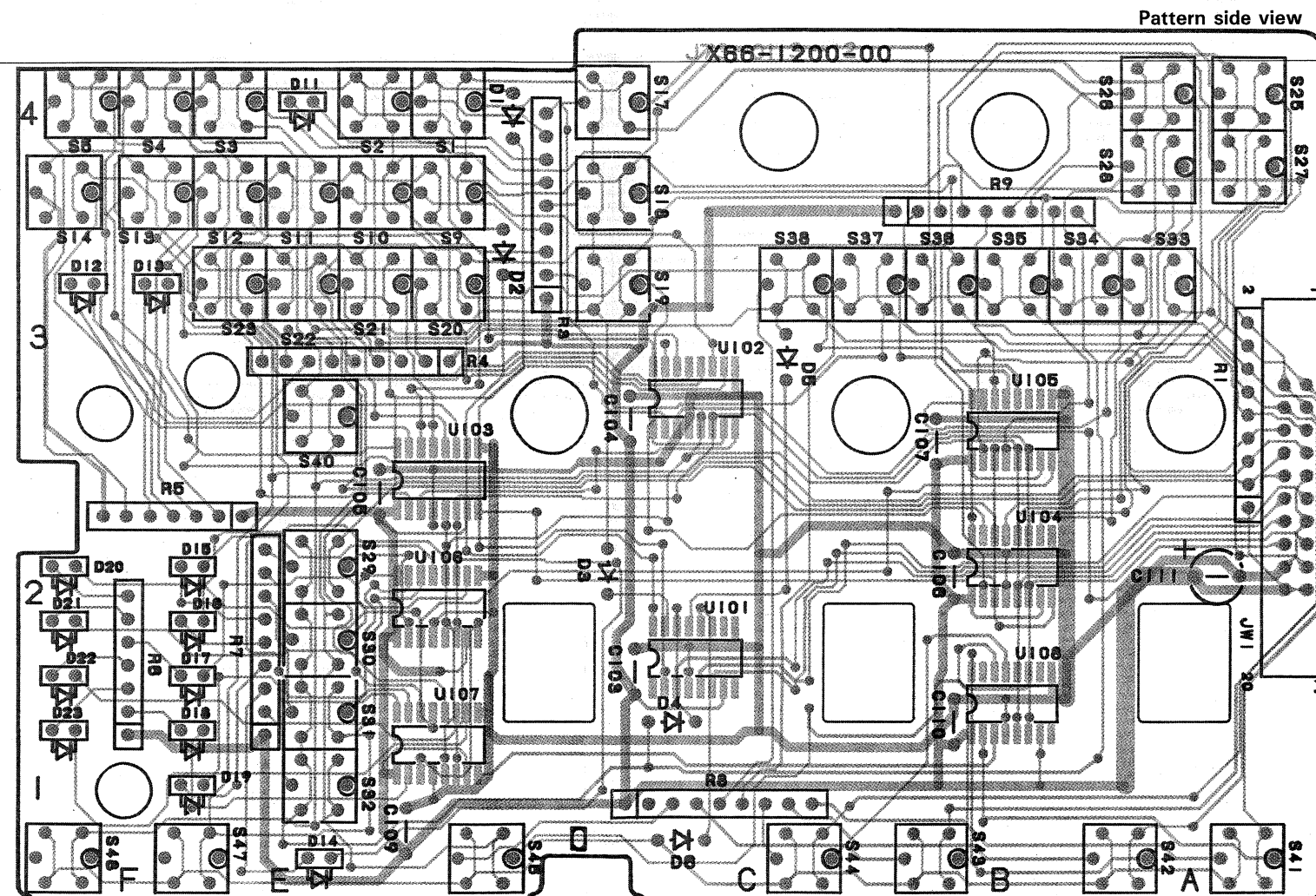
P.C. BOARD

PANEL VR UNIT (X66-1120-00)

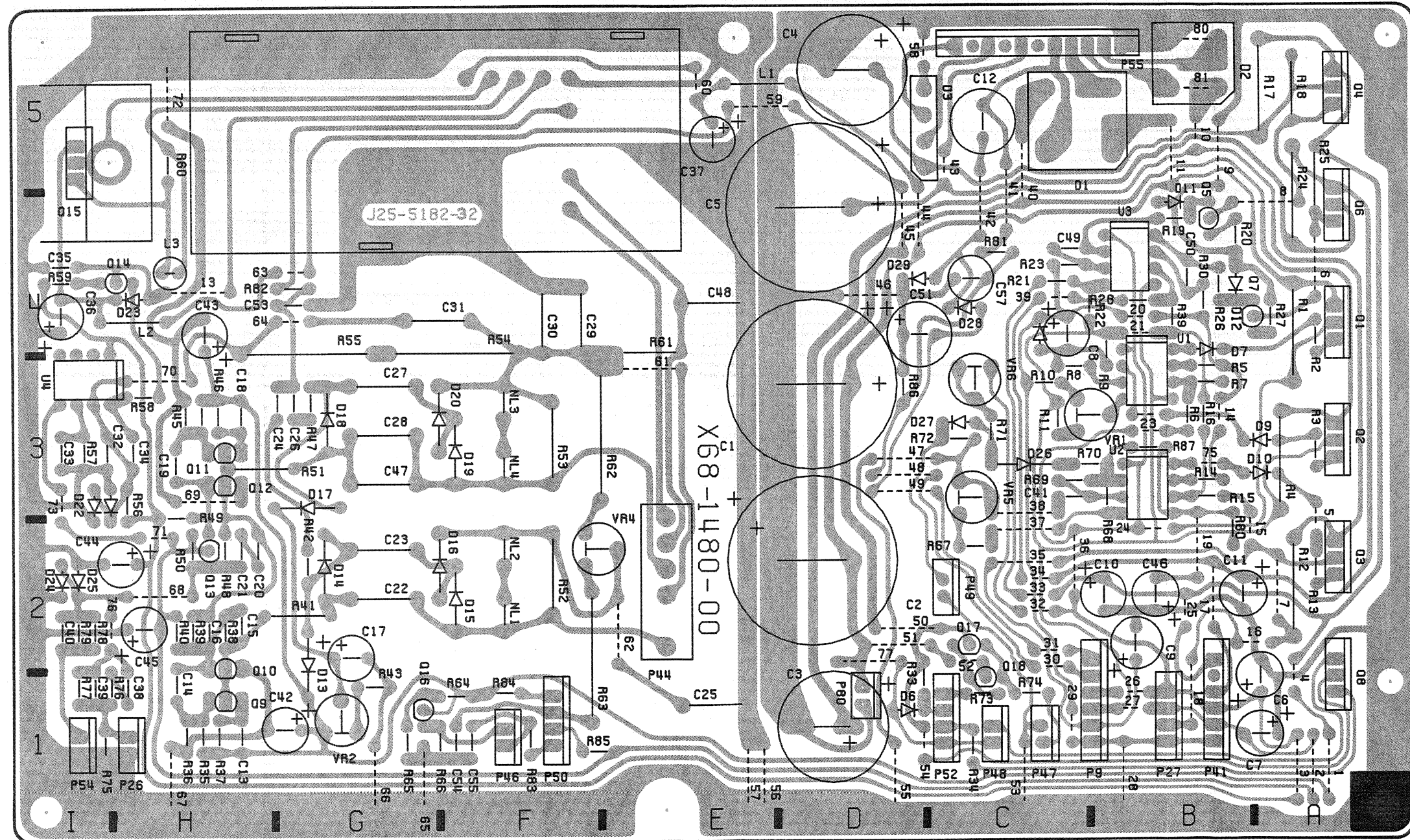


P.C. BOARD

PANEL SW UNIT (X66-1200-00)

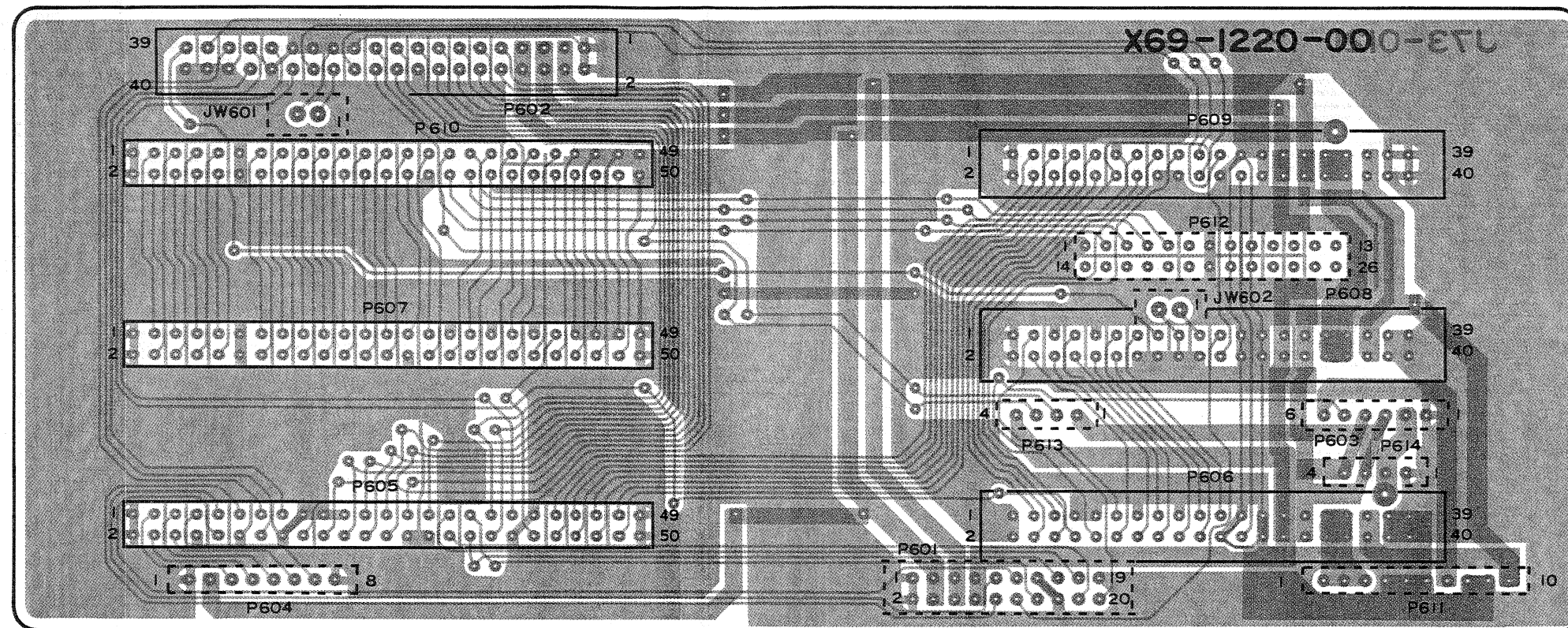


Pattern side view



P.C. BOARD

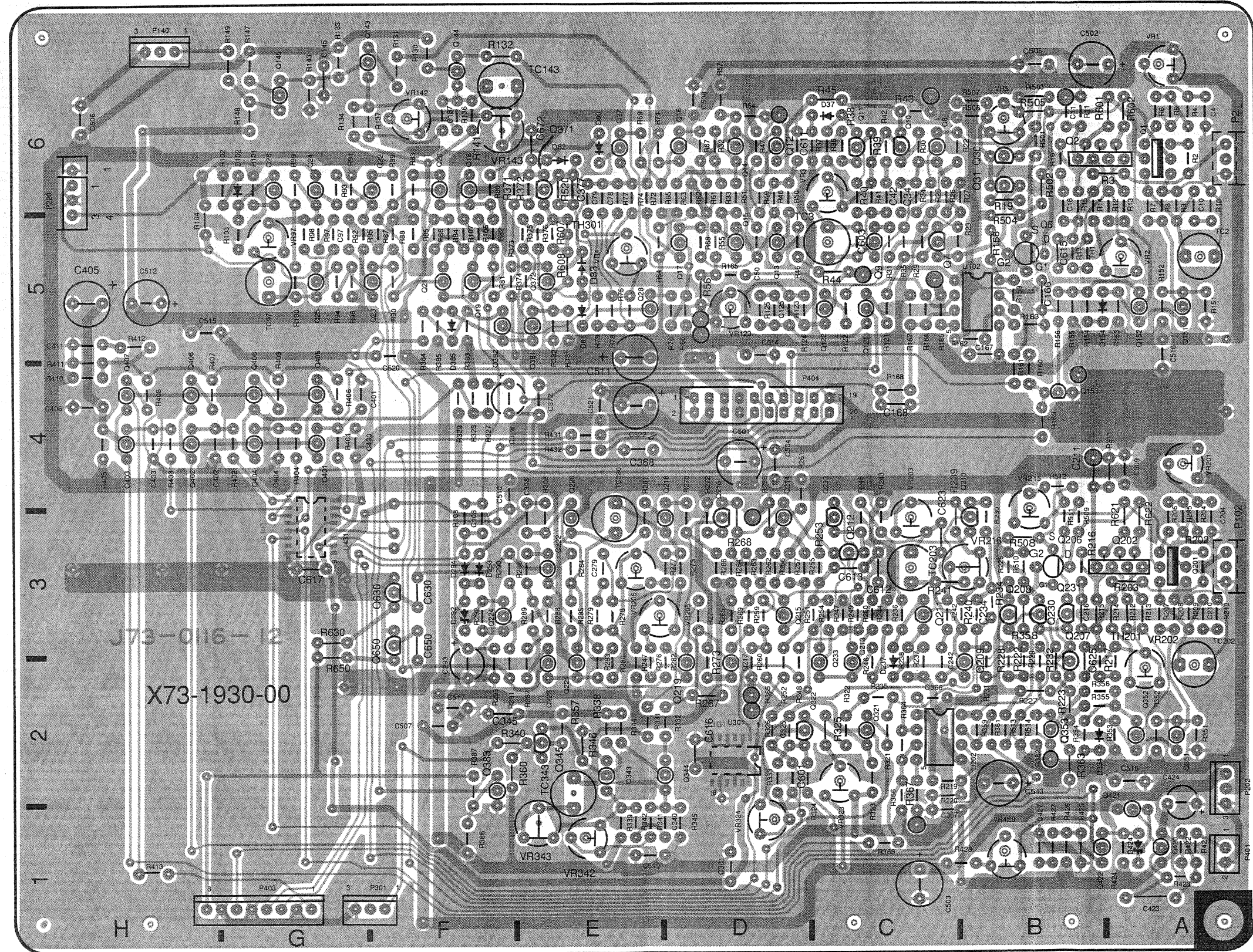
CONNECTION UNIT (X69-1220-00)



P.C. BOARD

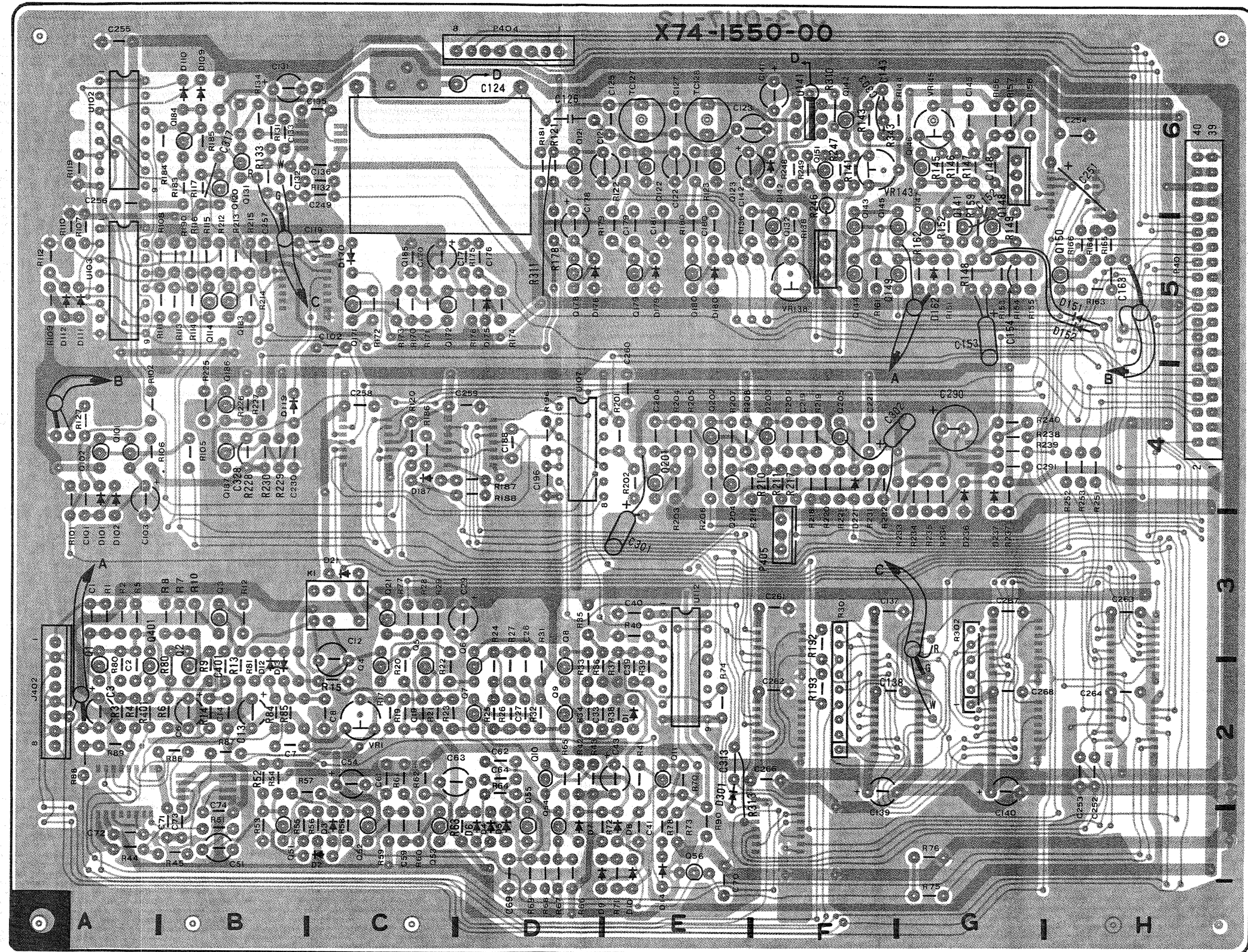
PRE AMP UNIT (X73-1930-00)

Pattern side view



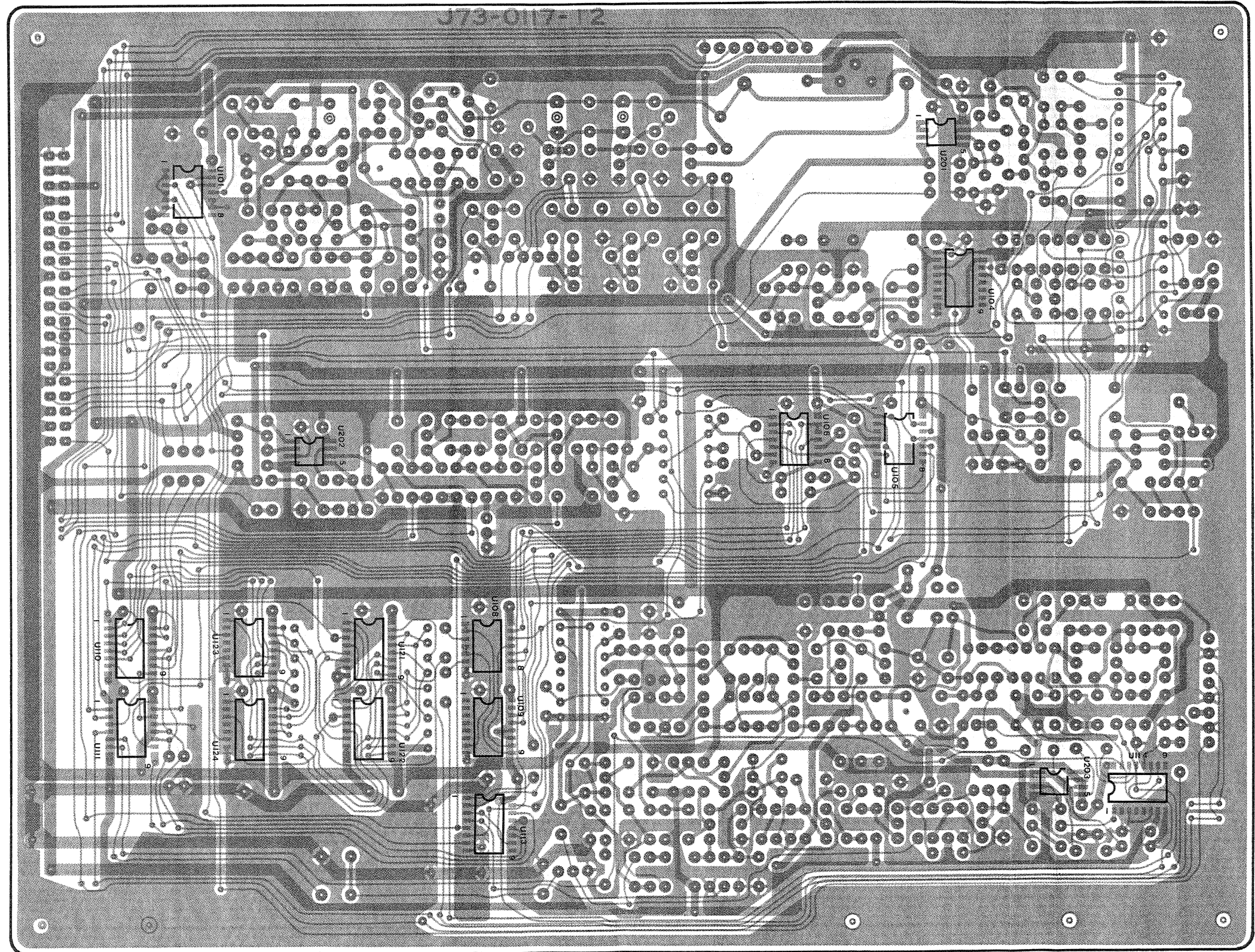
P.C. BOARD

HORIZONTAL UNIT (X74-1550-00) A



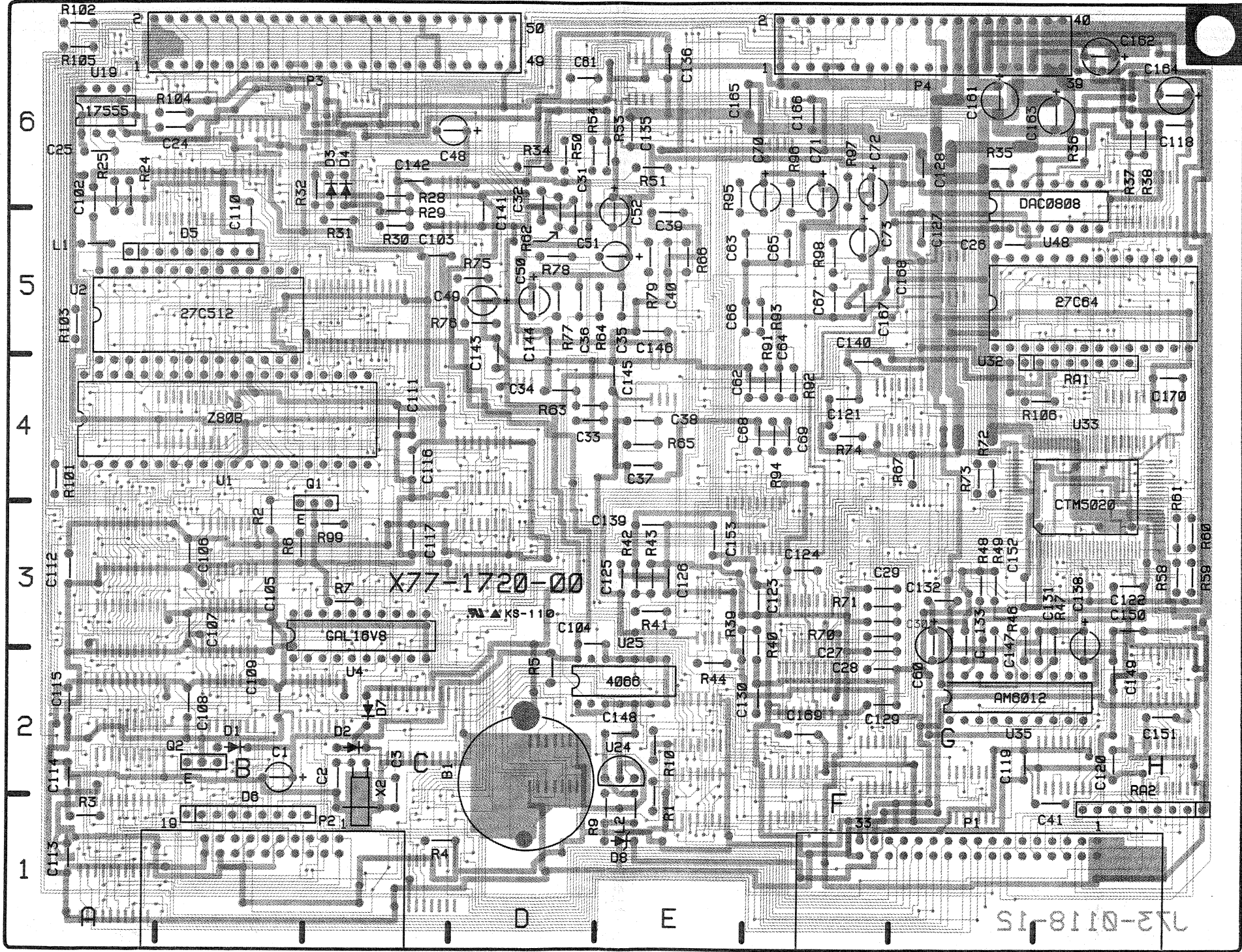
P.C. BOARD

HORIZONTAL UNIT (X74-1550-00) B



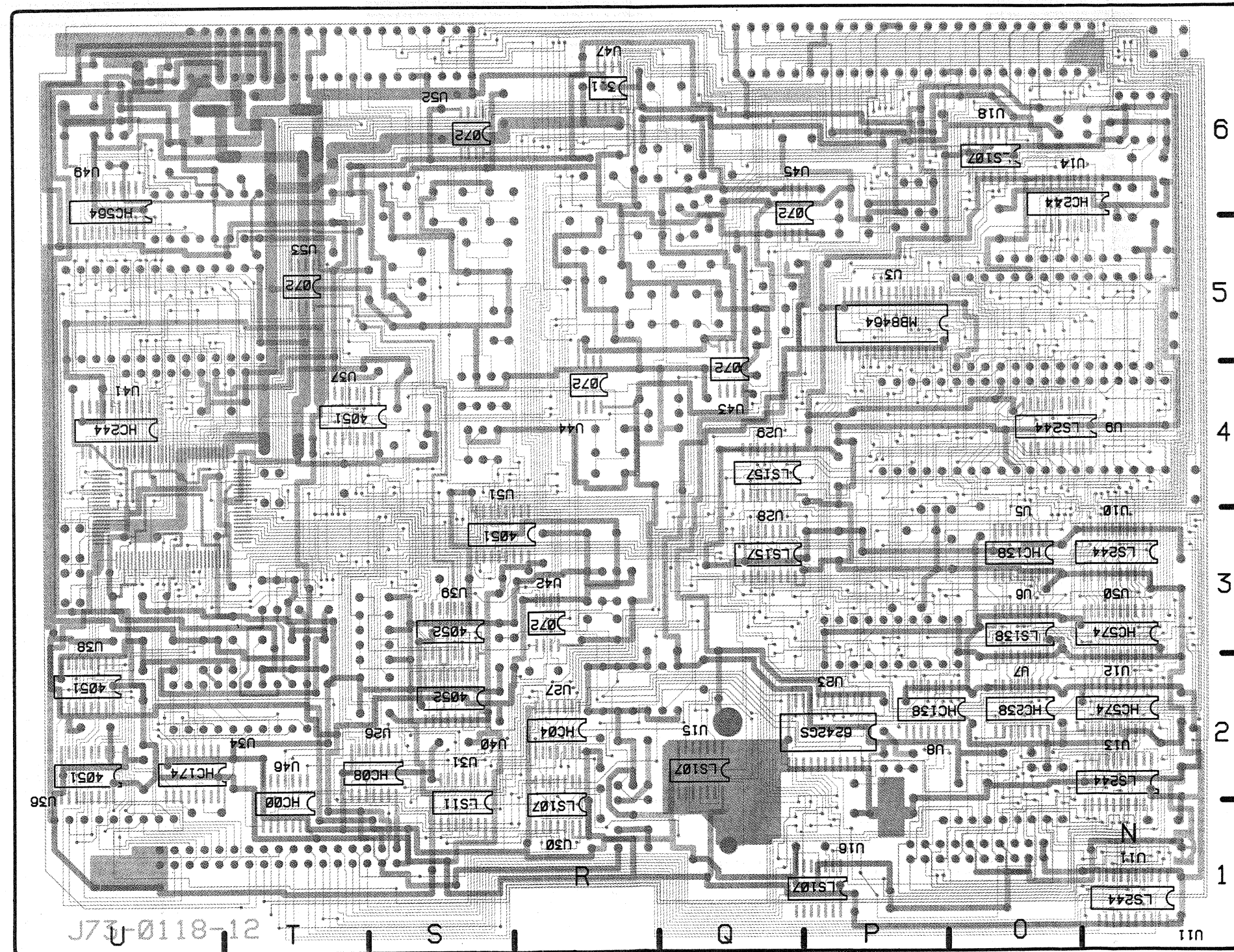
P.C. BOARD

READOUT UNIT (X77-1720-00) A



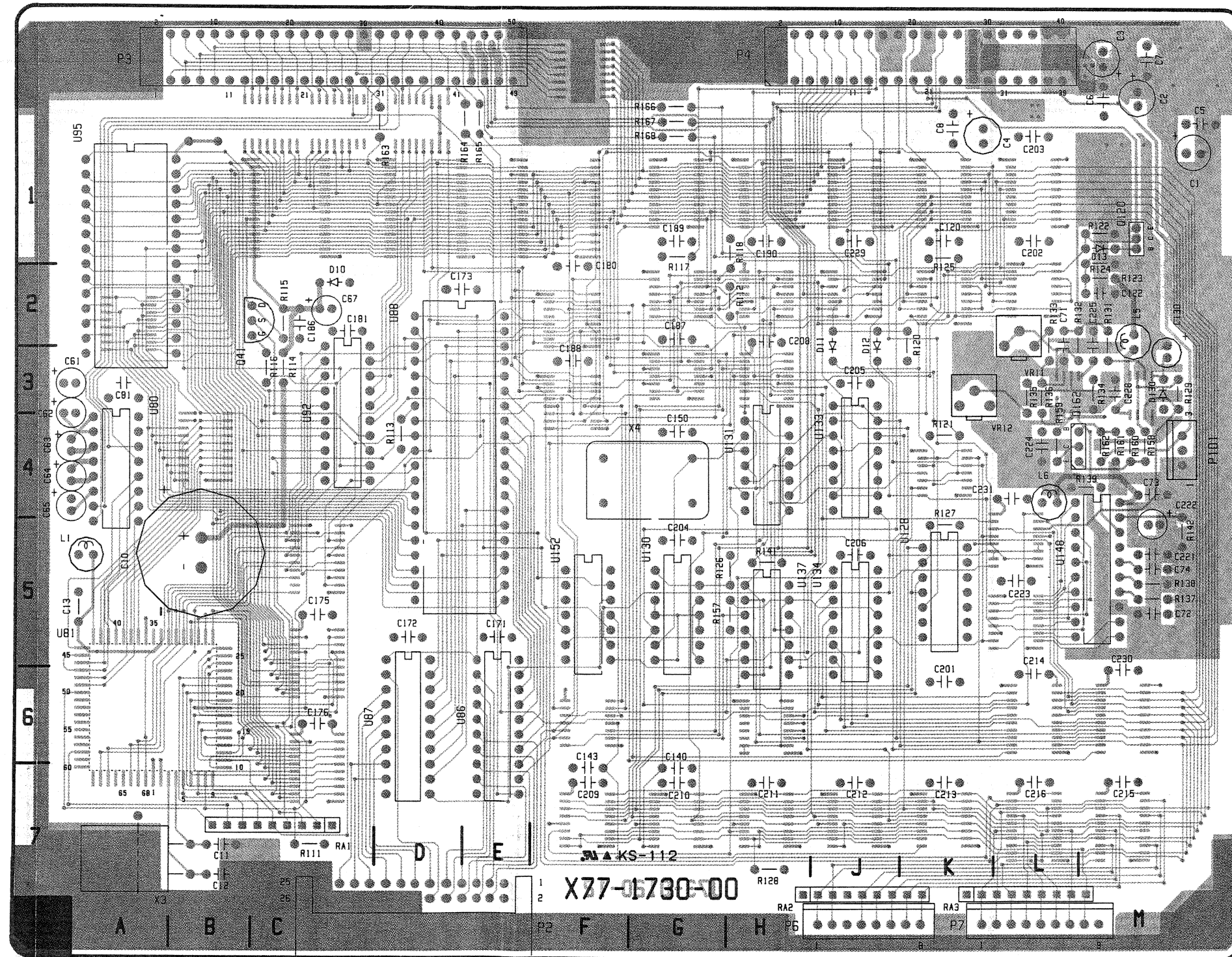
P.C. BOARD

READOUT UNIT (X77-1720-00) B



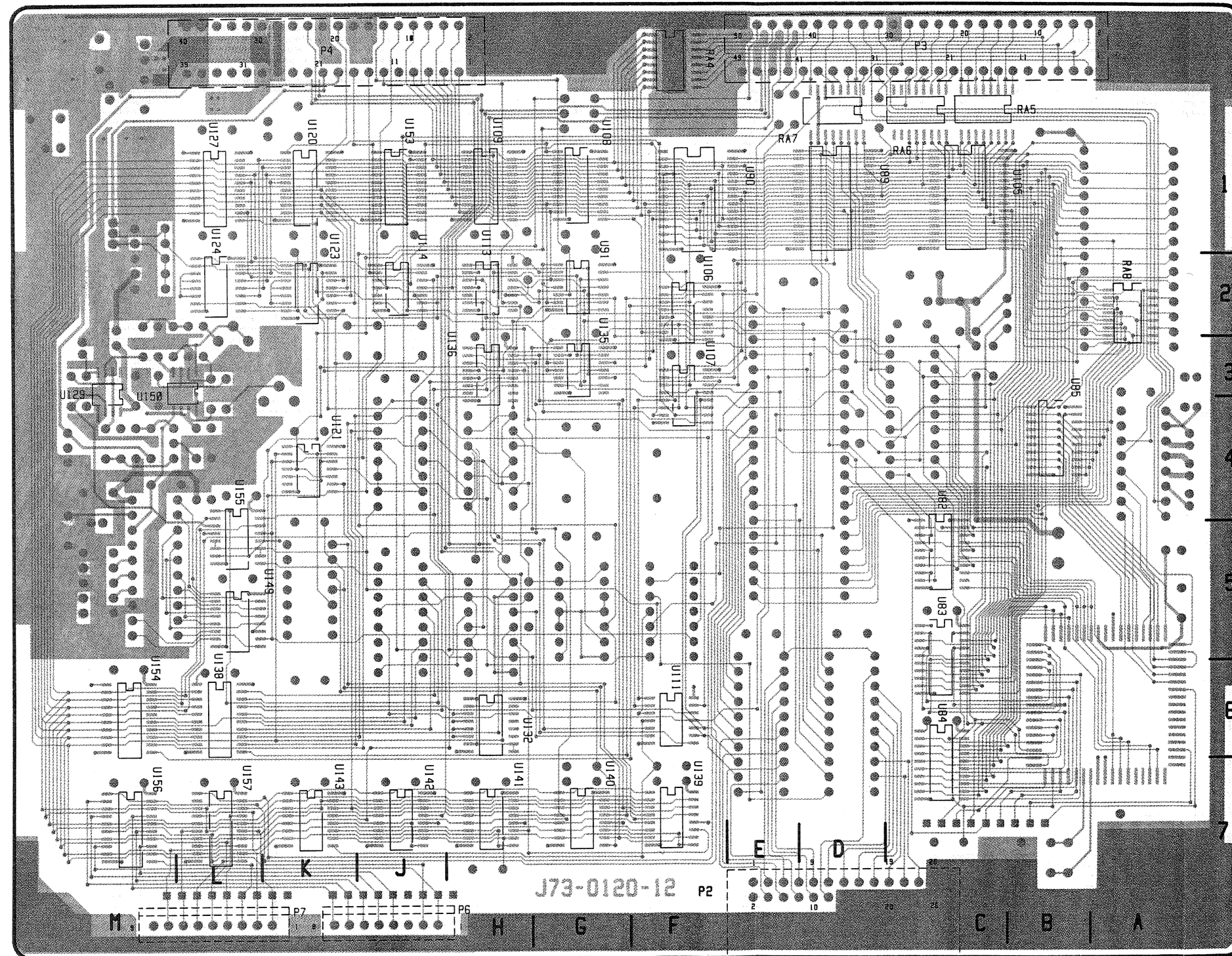
P.C. BOARD

STORAGE UNIT (X77-1730-00) A



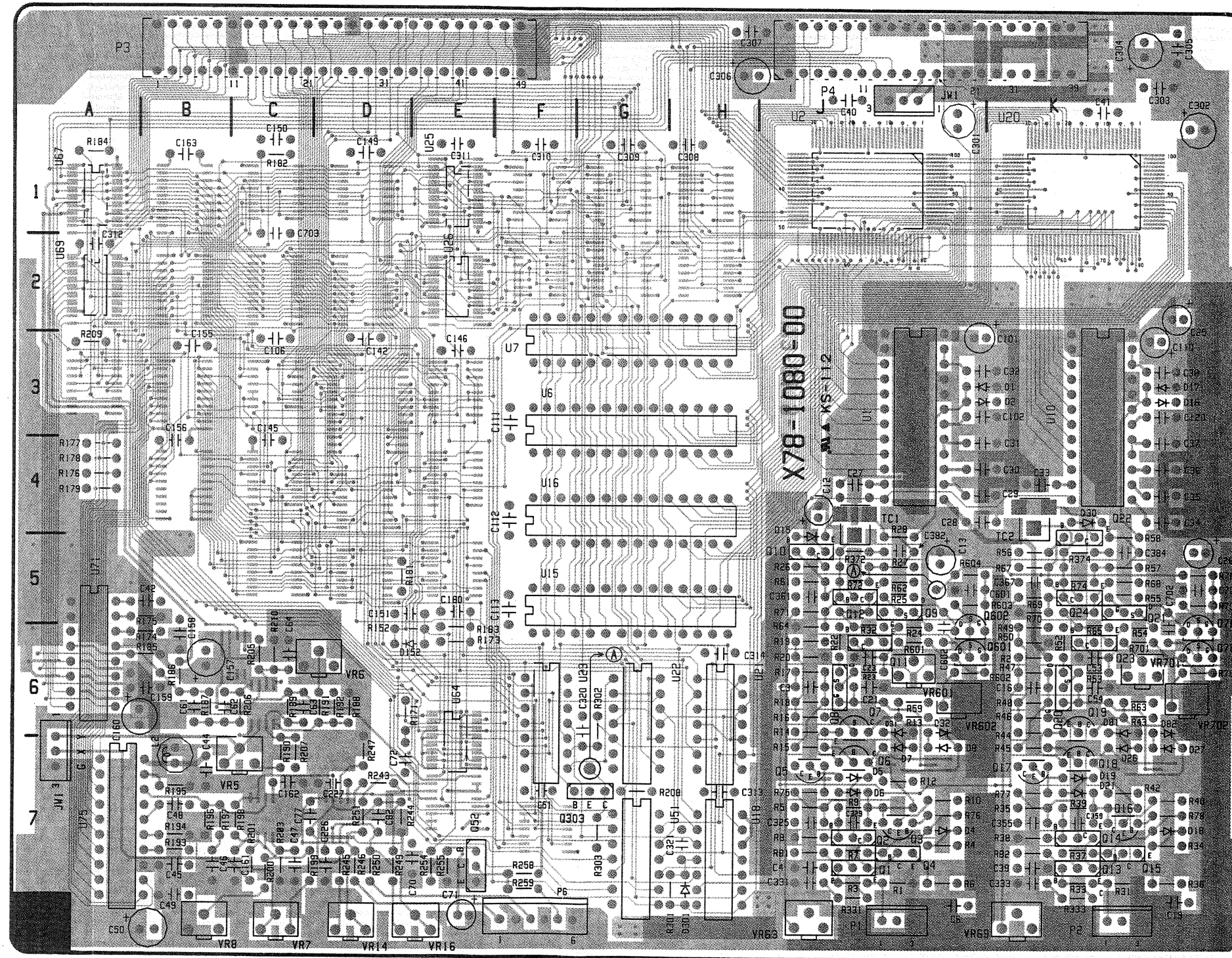
P.C. BOARD

STORAGE UNIT (X77-1730-00) B



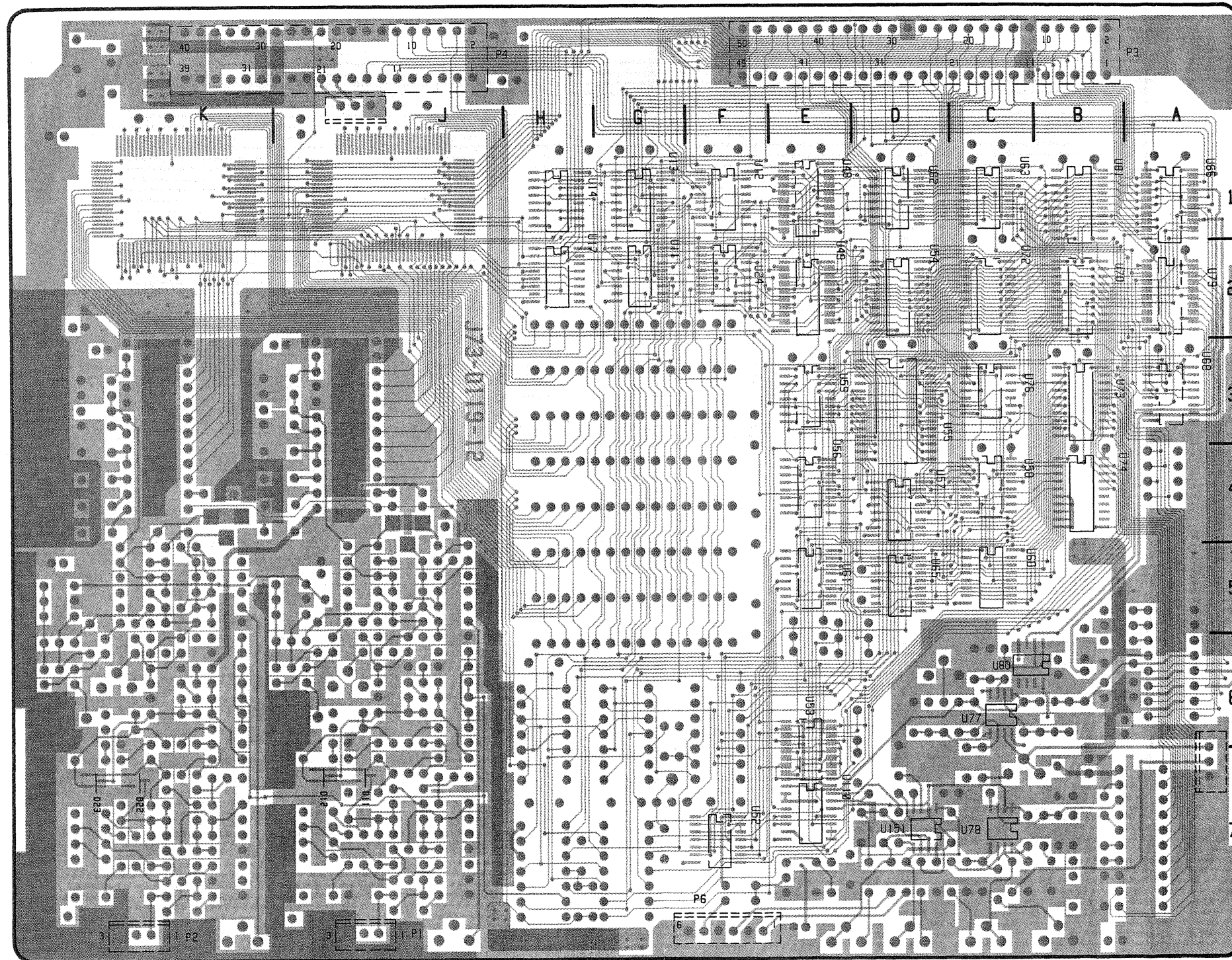
P.C. BOARD

A/D CONVERTER UNIT (X78-1080-00) A



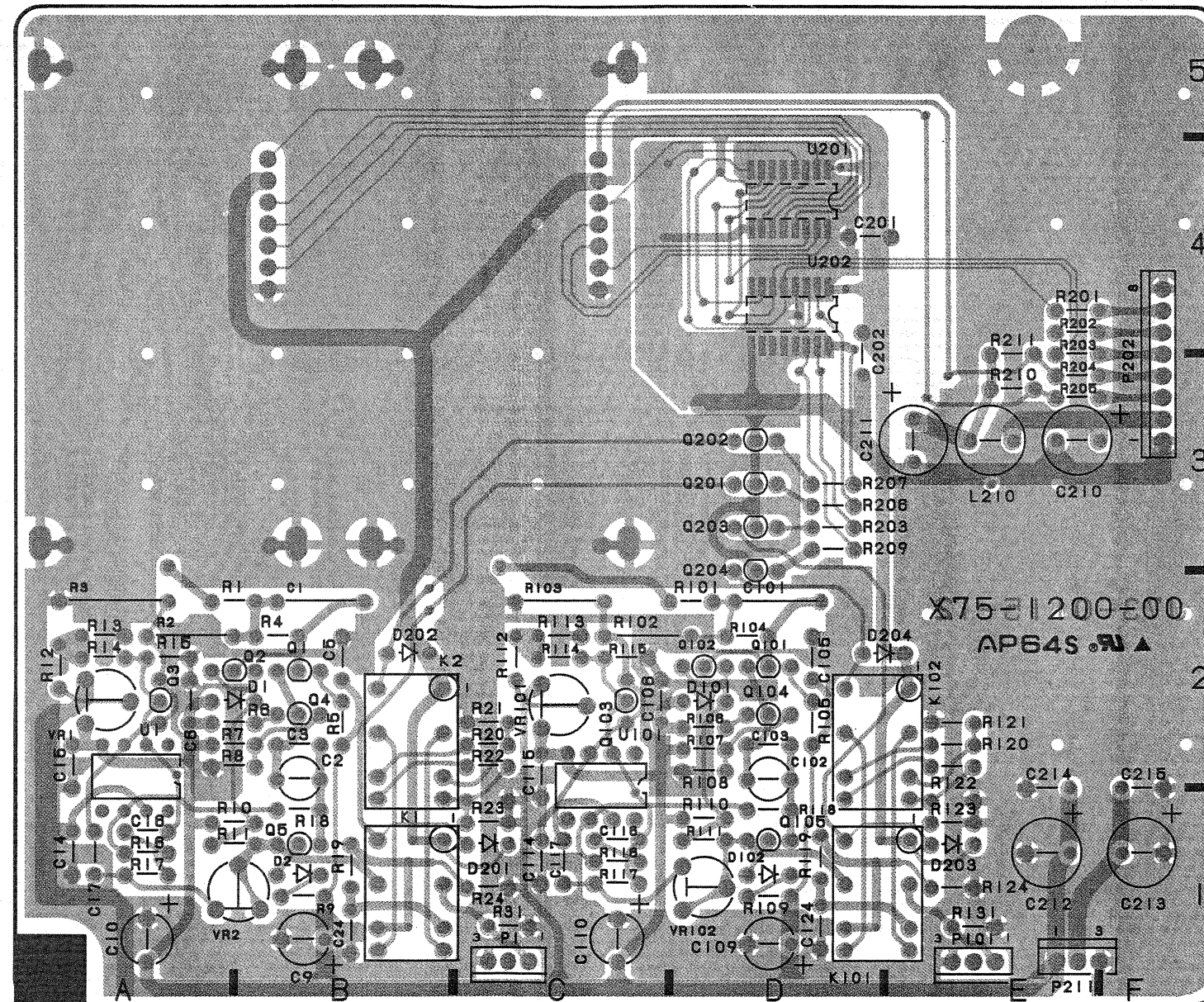
P.C. BOARD

A/D CONVERTER UNIT (X78-1080-00) B



P.C. BOARD

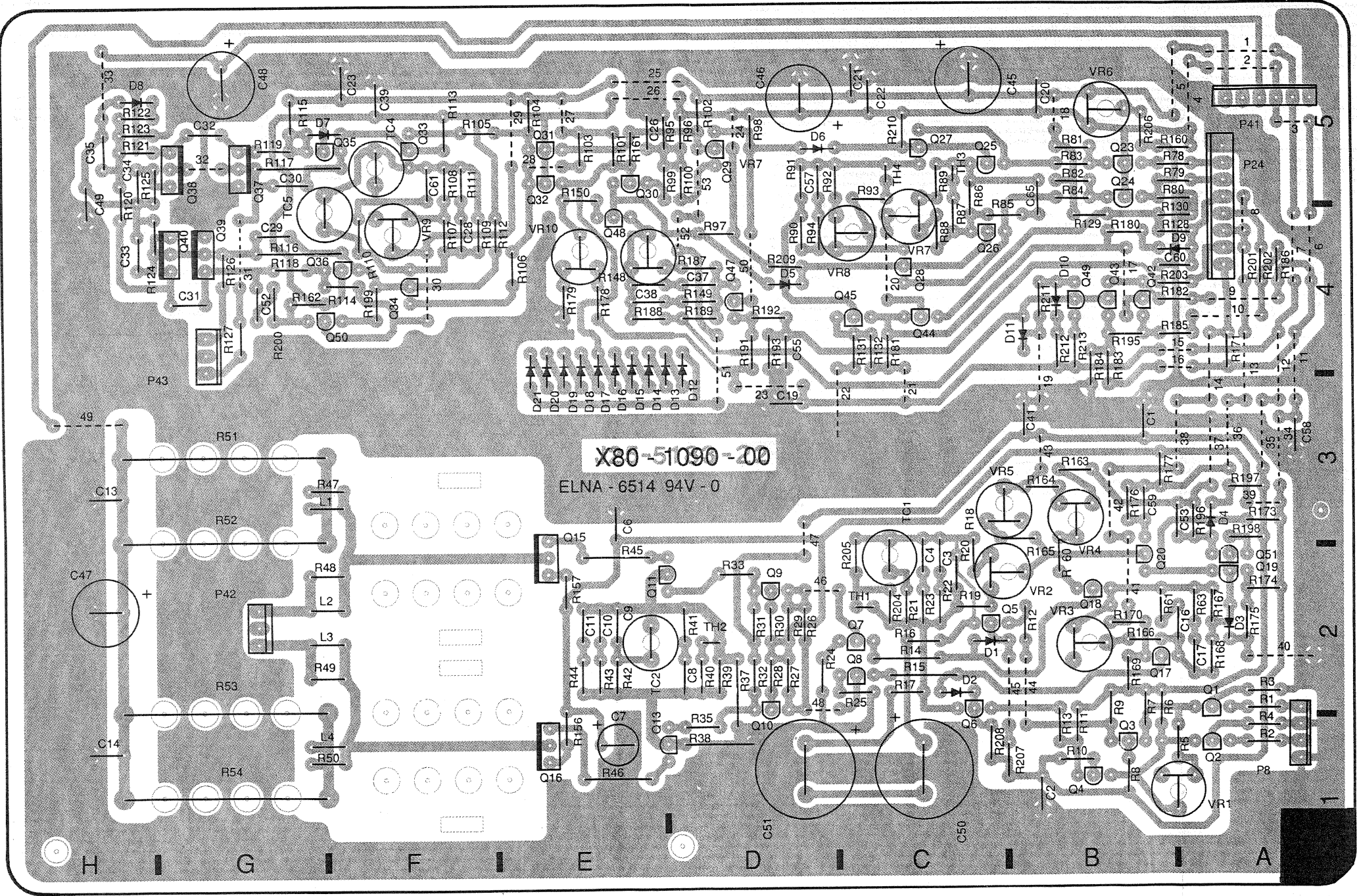
ATT UNIT (X75-1200-00)



P.C. BOARD

FINAL UNIT (X80-1090-02)

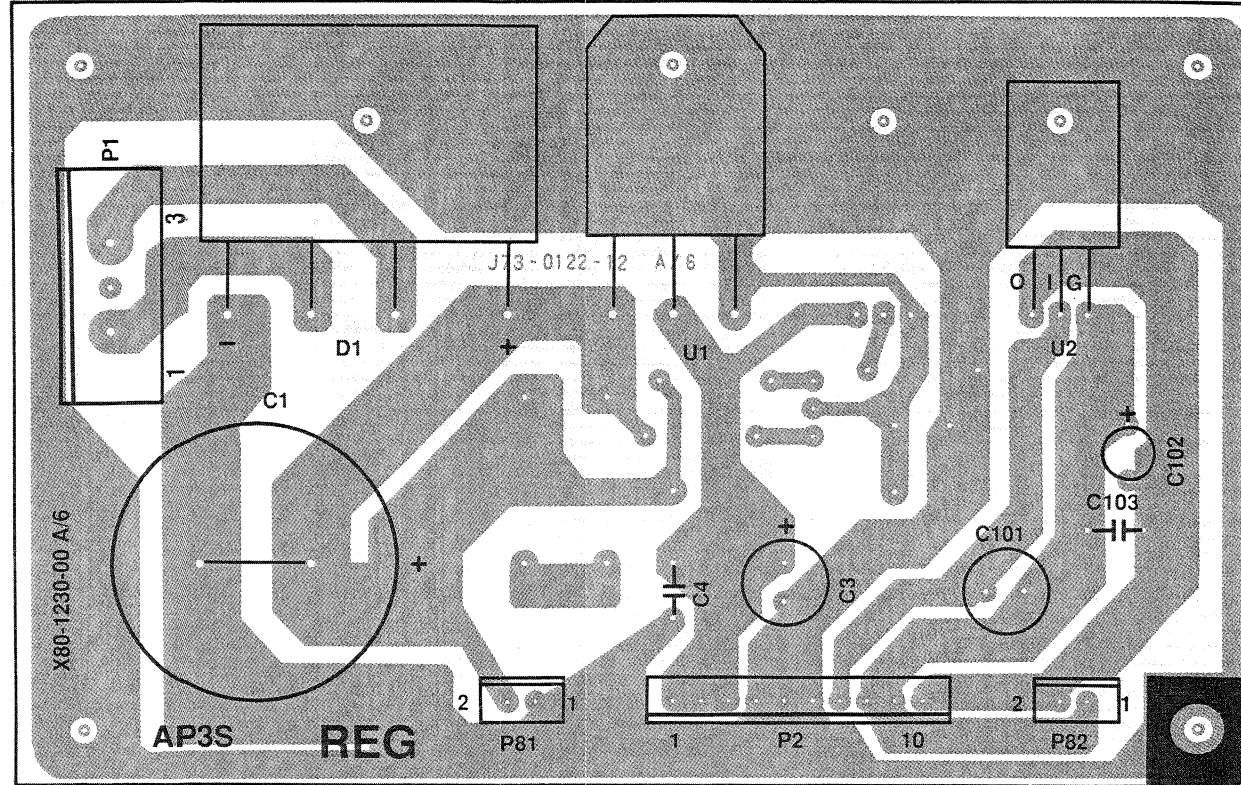
Pattern side view



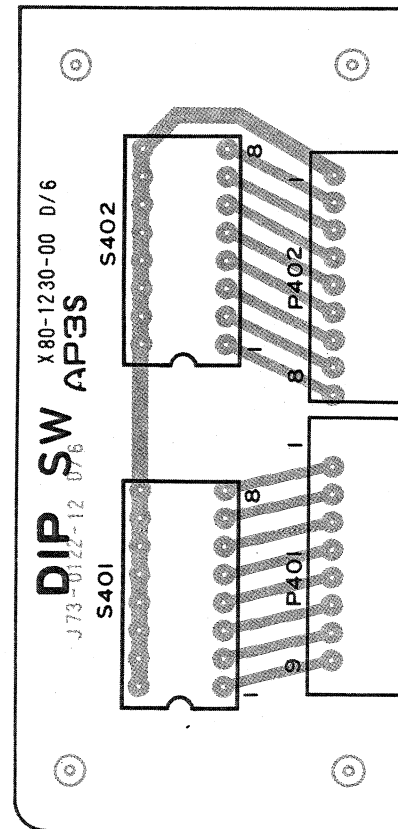
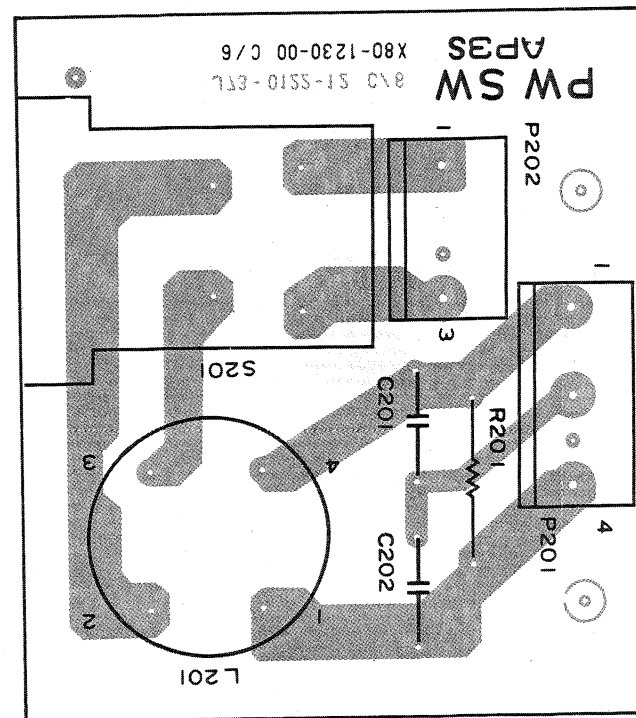
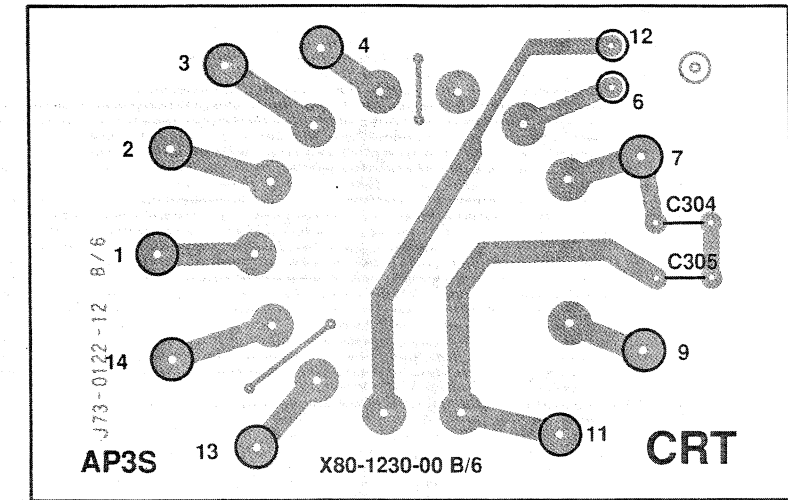
P.C. BOARD

AC FILTER UNIT (X80-1230-00)

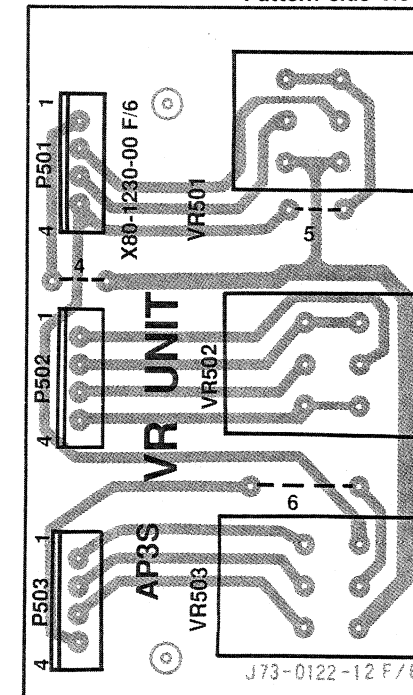
Pattern side view



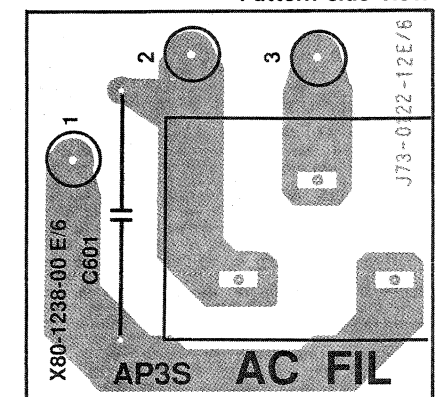
Pattern side view



Pattern side view

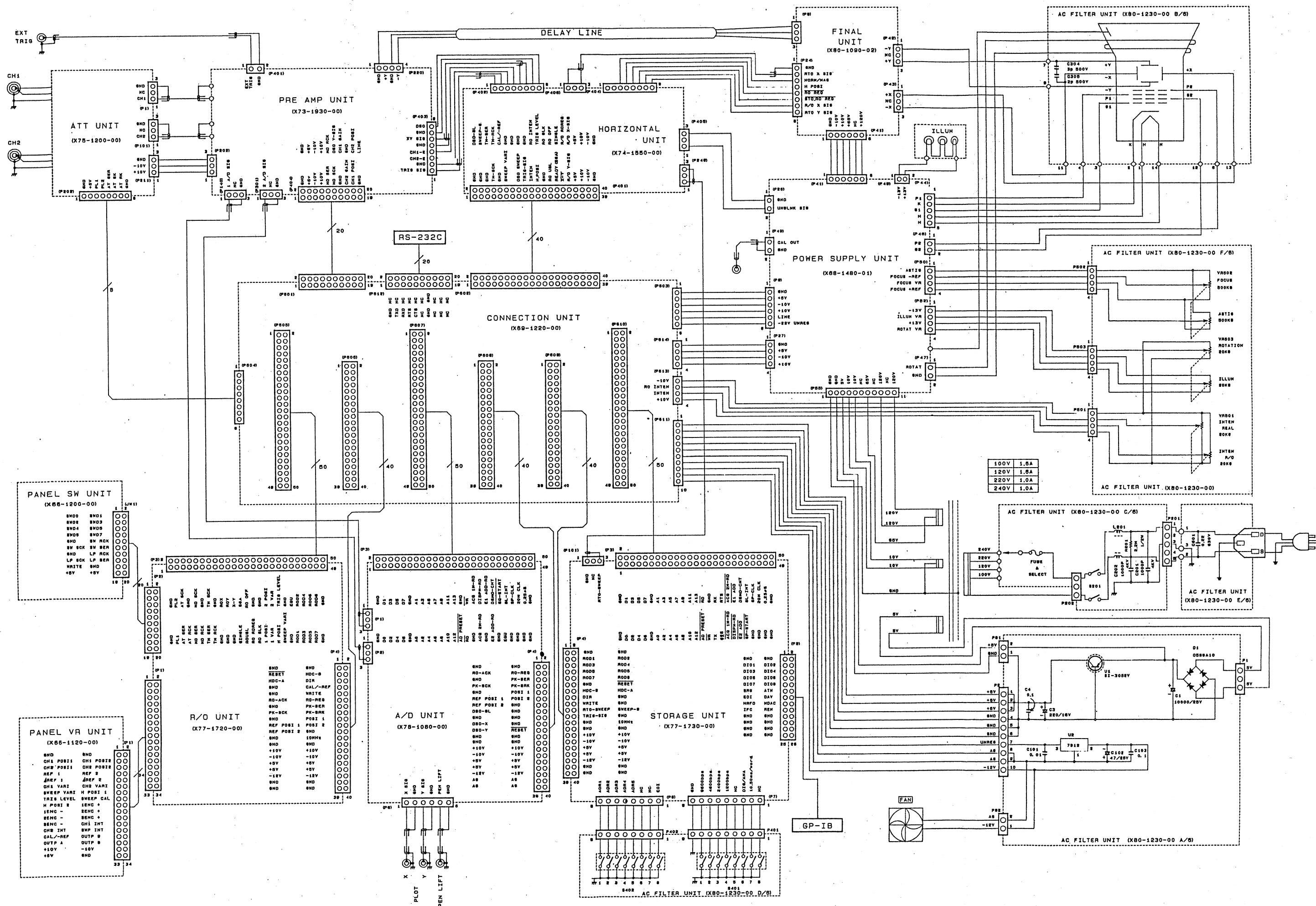


Pattern side view



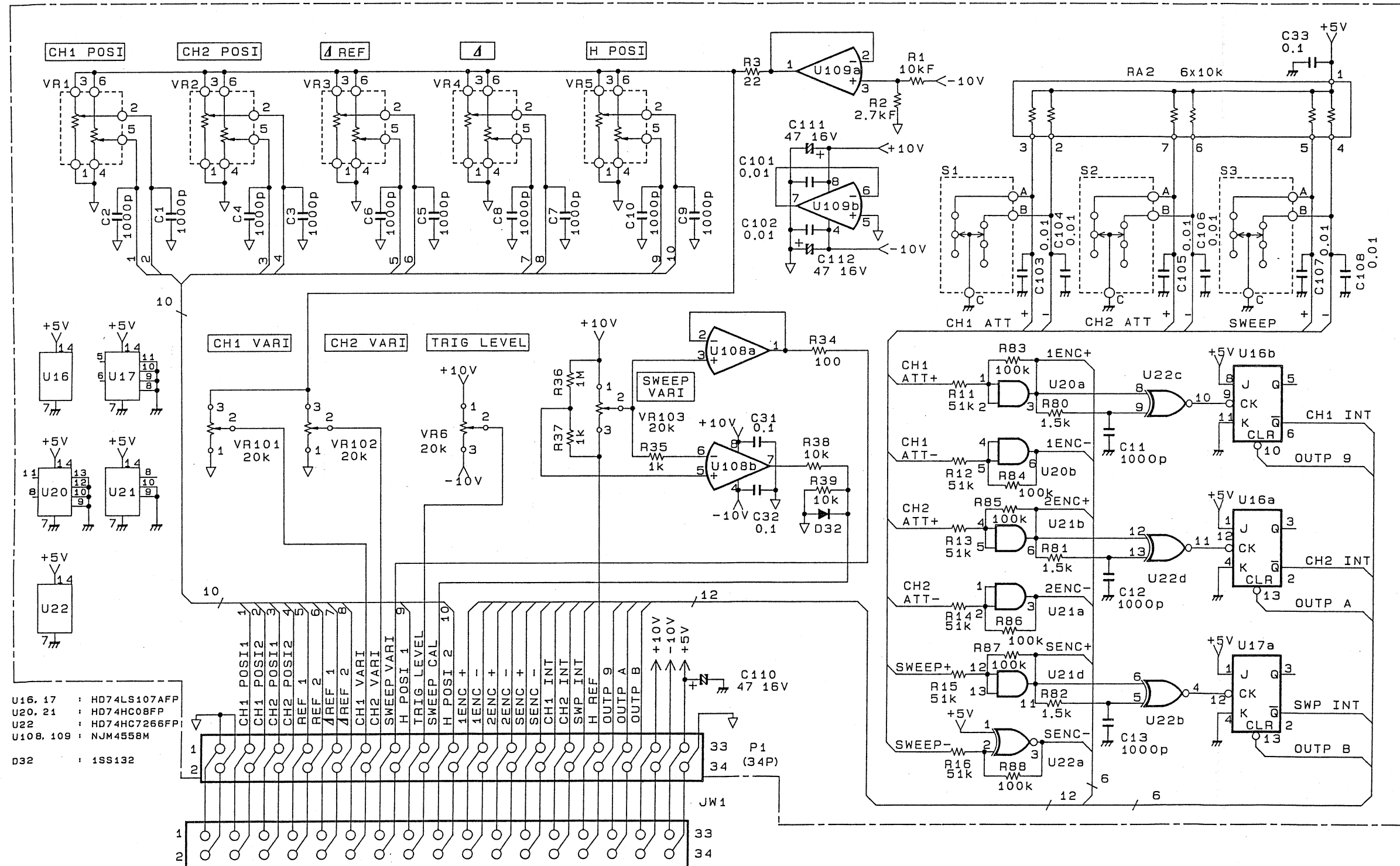
SCHEMATIC DIAGRAM

150VTM31



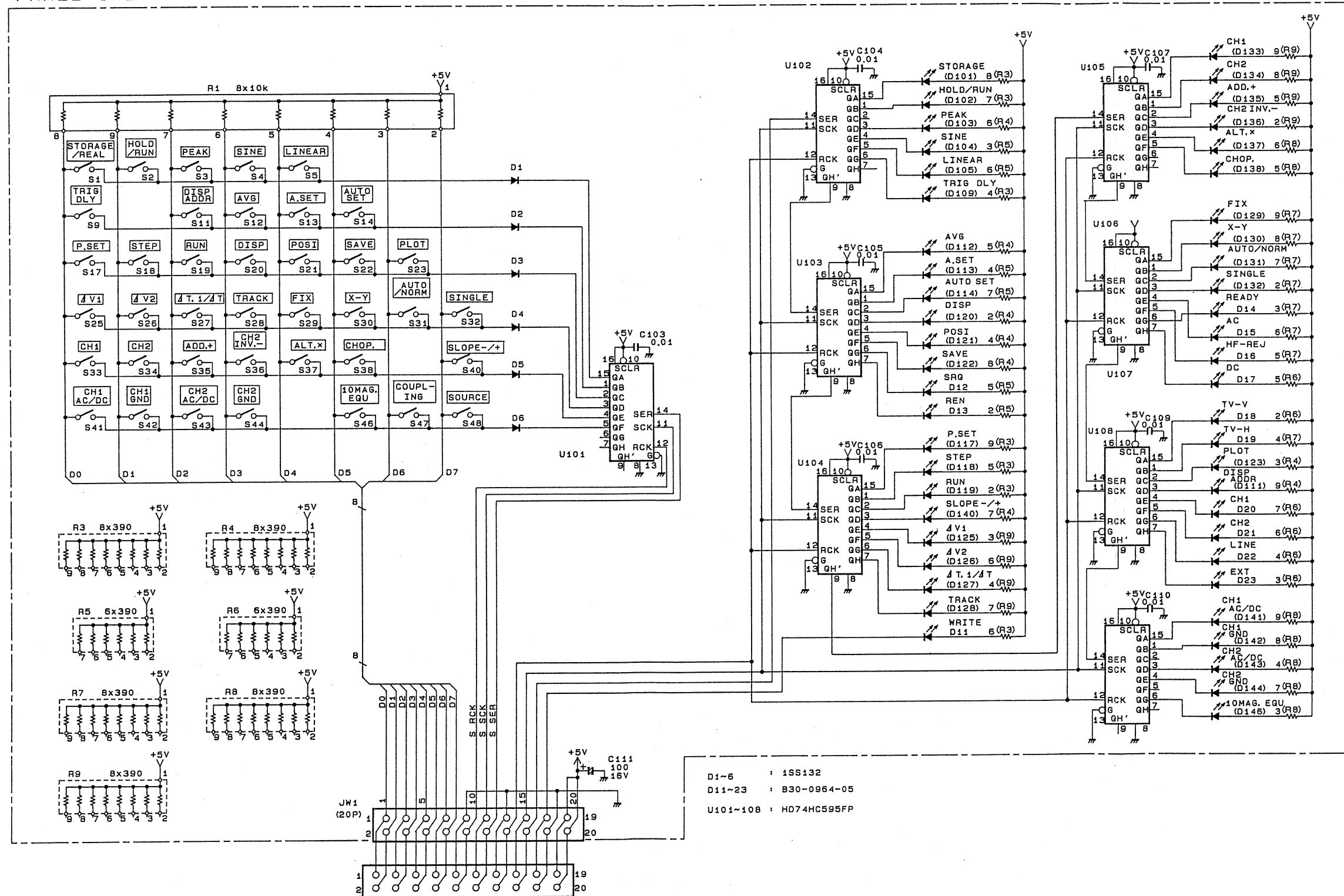
SCHEMATIC DIAGRAM

PANEL VR UNIT (X66-1120-00)

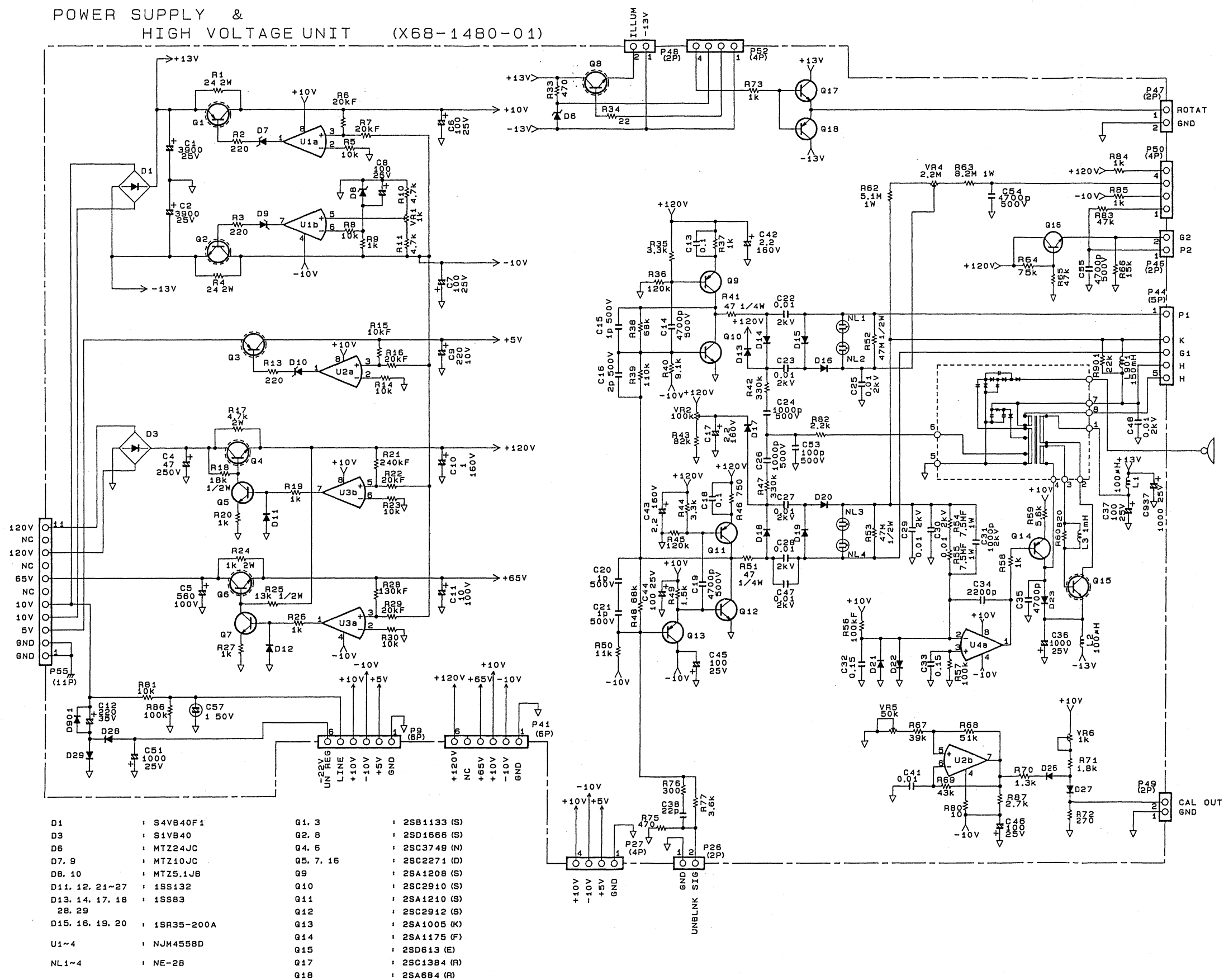


SCHEMATIC DIAGRAM

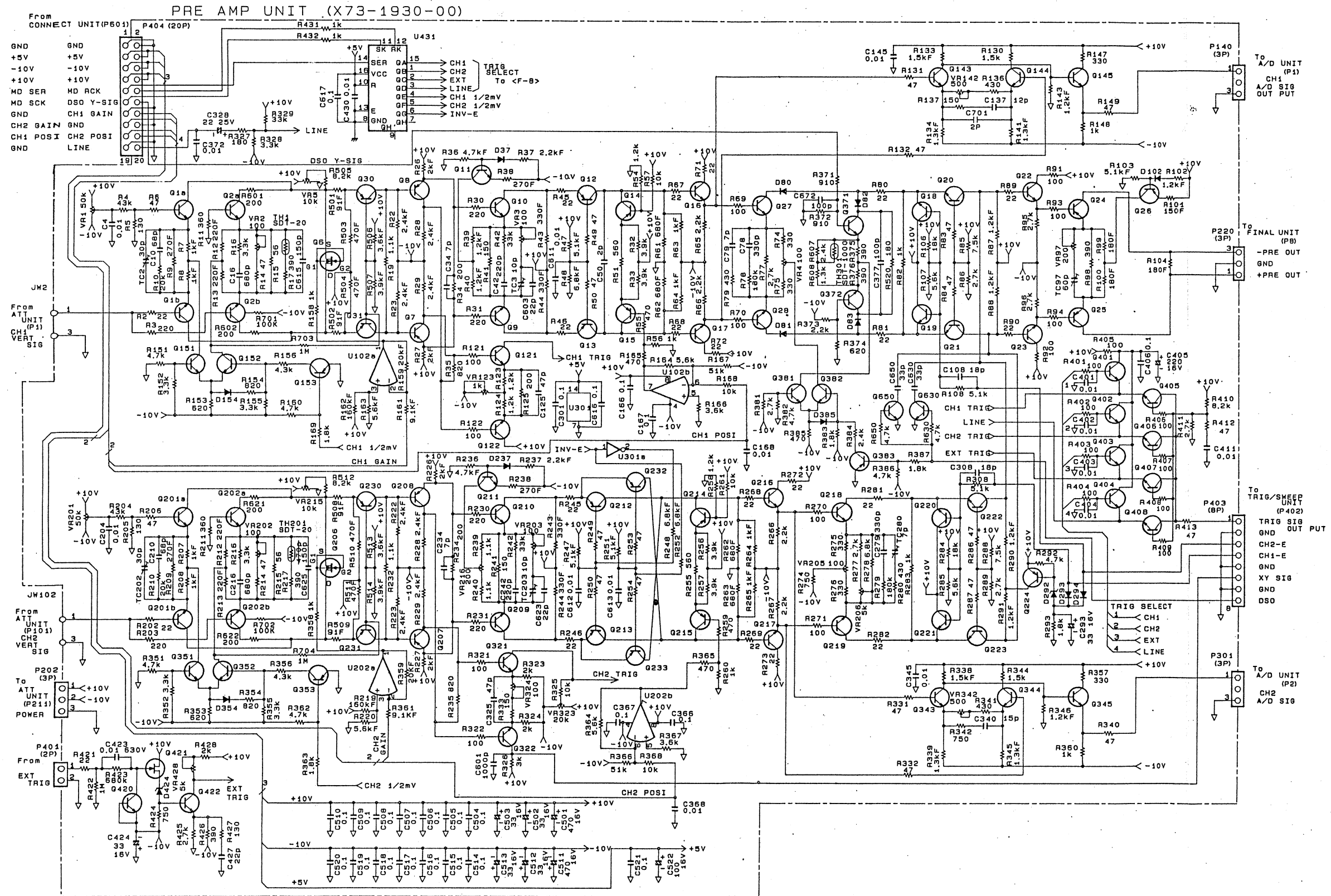
PANEL SWITCH UNIT (X66-1200-00)



POWER SUPPLY &
HIGH VOLTAGE UNIT (X68-1480-01)



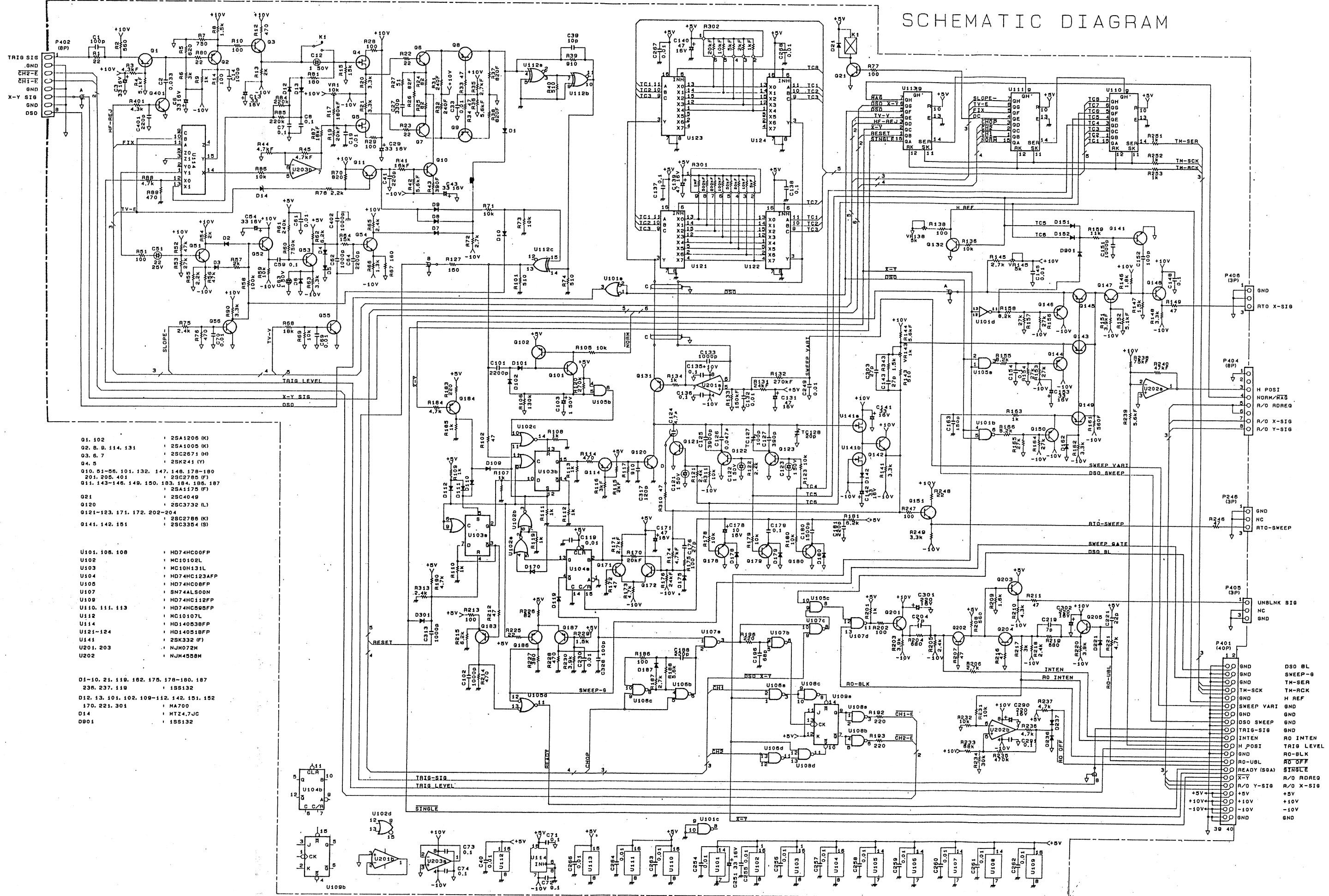
SCHEMATIC DIAGRAM



U102, 202	1	2SC4072
U301	1	HD74HC04FP
U431	1	HD74HC595FP
D37, 102, 154, 237, 354	1	1SS132
385	1	MA700
D80-83, 293, 294	1	MT25.2JB
D292, 424	1	MT25.2JB
Q1, 201	1	2SC4072
Q2, 202	1	2SC3381 (GR)
Q6, 206	1	3SK121 (GR)
Q7, 8, 28, 30, 31, 207, 208	1	2SA1005 (K)
Q9, 10, 209, 210	1	2SC2671 (H)
Q11, 20-23, 24, 25, 212-215	1	2SC3354 (S)
Q16, 17, 216, 217	1	2SA1205 (K)
Q18, 19, 220, 221, 381, 382	1	2SC3779 (D)
Q152, 352	1	2SC2785 (S)
Q153, 353, 383	1	2SA1175 (F)
Q421	1	2SK404 (F)
Q630, 650	1	2SC3315 (C)

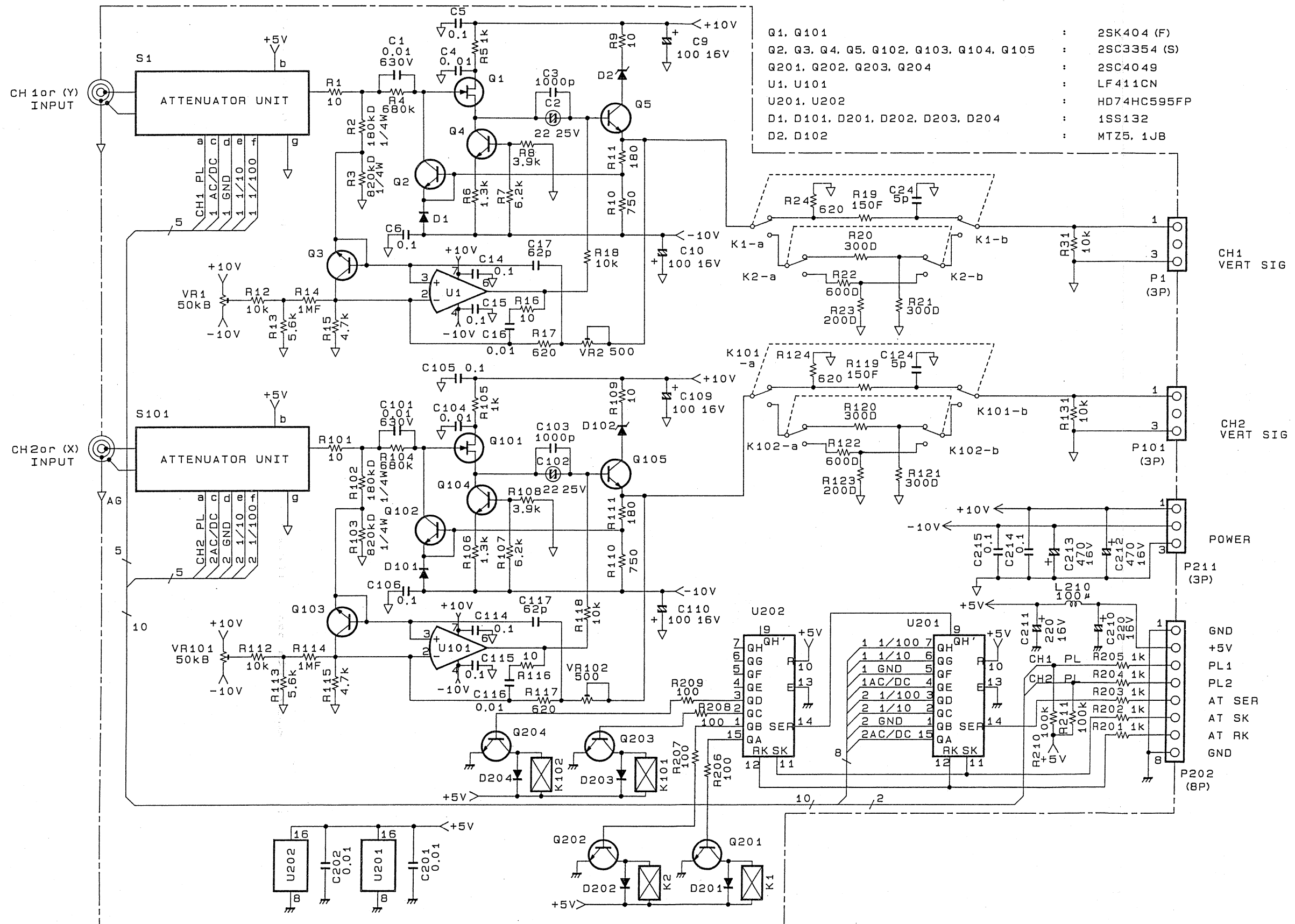
HORIZONTAL UNIT (X74-1550-00)

SCHEMATIC DIAGRAM



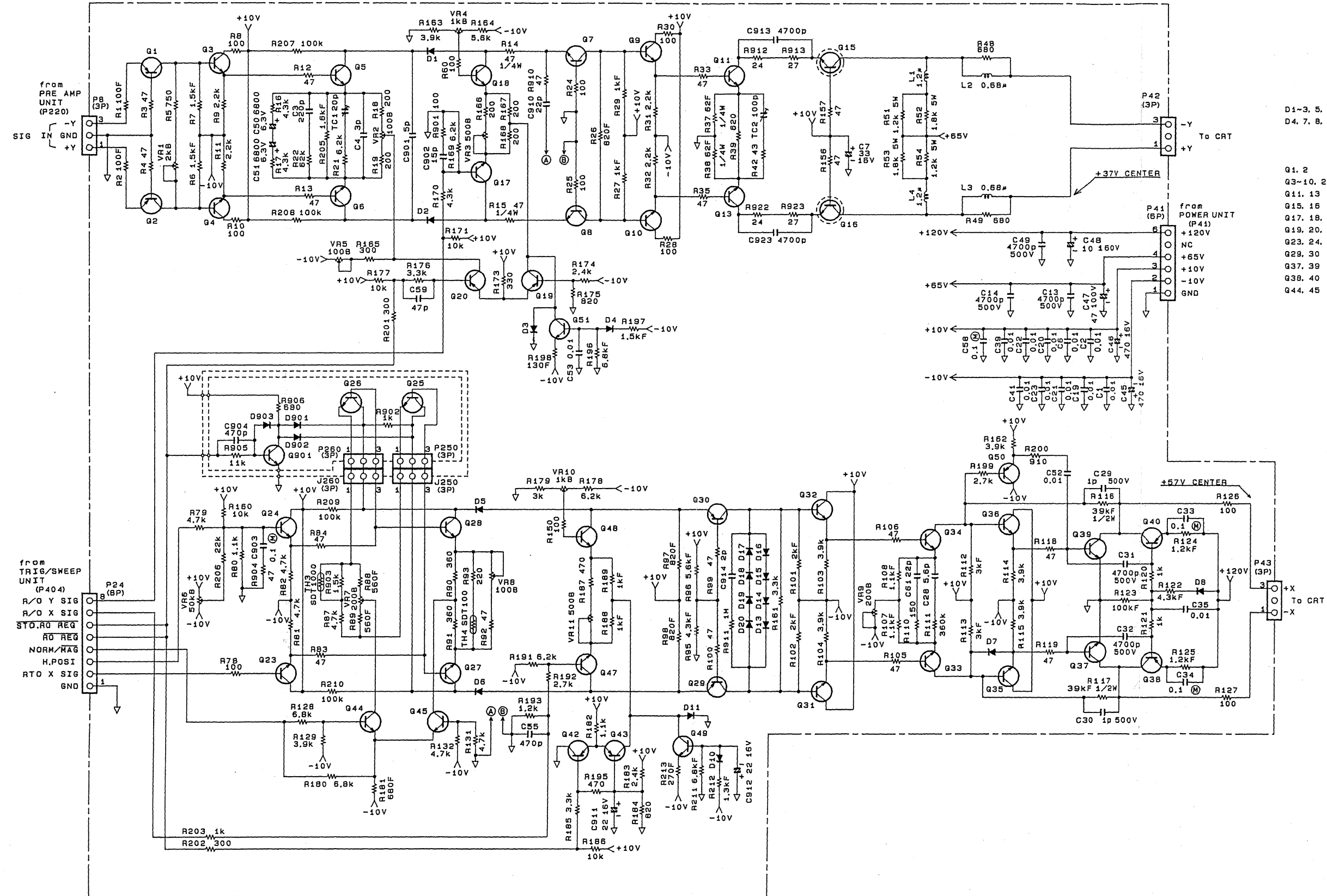
SCHEMATIC DIAGRAM

ATT UNIT (X75-1200-00)

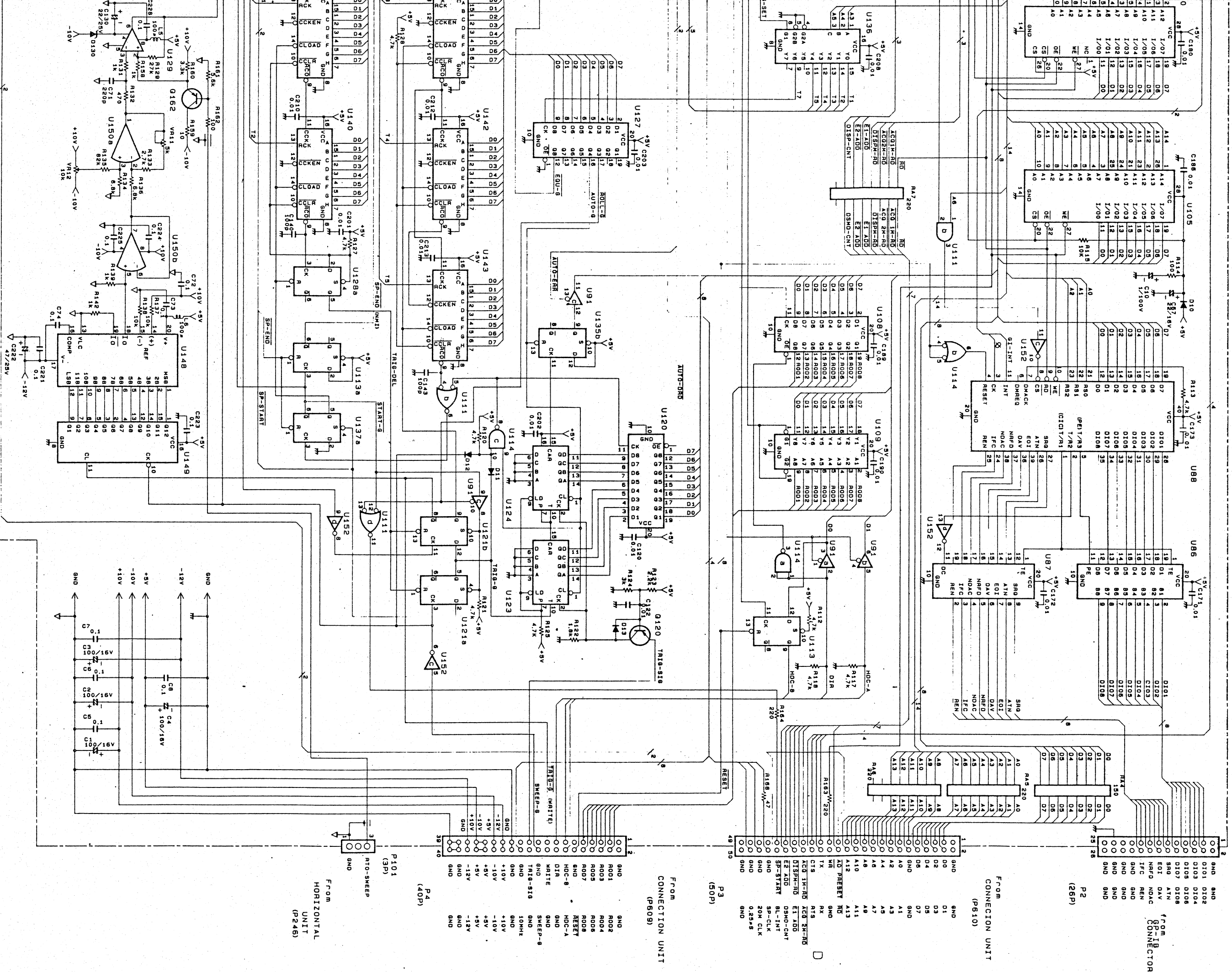


SCHEMATIC DIAGRAM

FINAL UNIT (X80-1090-02)



D1-3, 5, 6, 11, 903	MA700
D4, 7, 8, 10, 13-20, 901, 902	1SS132
Q1, 2	2SA1206 (K)
Q3-10, 25-28, 33-36	2SC3354 (S)
Q11, 13	2SC3779 (D)
Q15, 16	2SC3596 (E)
Q17, 18, 47, 48	2SC3315 (D)
Q19, 20, 42, 43, 50	2SA1005 (K)
Q23, 24, 31, 32, 49, 51, 901	2SC2785 (F)
Q29, 30	2SA1175 (F)
Q37, 39	2SC2911 (S)
Q38, 40	2SA1209 (S)
Q44, 45	2SC2786 (K)



READOUT UNIT (X77-1720-00)

U1	LH00808F	U26,U29	HD74LS157FP
U2	T93-0751-04	U31	HD74LS11FP
U3	MB8464-10LL-FP	U32	T93-0752-04
U4	CTM5110	U33	CTM5020
U5,U8	HD74HC138FP	U34	HD74HC174FP
U6	HD74LS138FP	U35	AM60120C
U7	HD74HC38FP	U36,U37,U38,U51	HD140518FP
U9,U10,U11,U13,U15	HD74HC244FP	U39,U40	HD140528FP
U12,U50	HD74HC574FP	U42,U43,U44,U45,U52,U53	NJM4558M
U14,U41	HD74HC244FP	U46	HD74HC00FP
U15,U16,U18,U30	HD74LS107AFP	U47	NJM311M
U19	HA17555PS	U48	DAC0808LCN
U23	MSM62428GS-VK	U49	HD74HC564FP
U24	PST5188	01,02	2SC3354 (S)
U25	HD140668P	08	MT25.1UB
U26	HD74HC08FP	05,06	DAP803
U27	HD74HC04FP	01,02,03,04,07	1SS132

FROM
PANEL VR UNIT (P1)

GND	CH1 POS11	GND	CH2 POS12
REF 1	CH2 POS11	REF 2	CH2 POS12
AREF 1	AREF 2		
CH1 VARI	CH2 VARI		
SWEEP VARI	H POS1 1		
TRIG LEVEL	SWEEP CAL		
H POS1 2	15ENC +		
15ENC -	SENG -		
SENG -	CH1 INT		
CH2 INT	SWP INT		
CAL/-REF	OUTP B		
OUTP A			
+10			
-10V			
GND			

FROM
CONNECTION UNIT (G05)

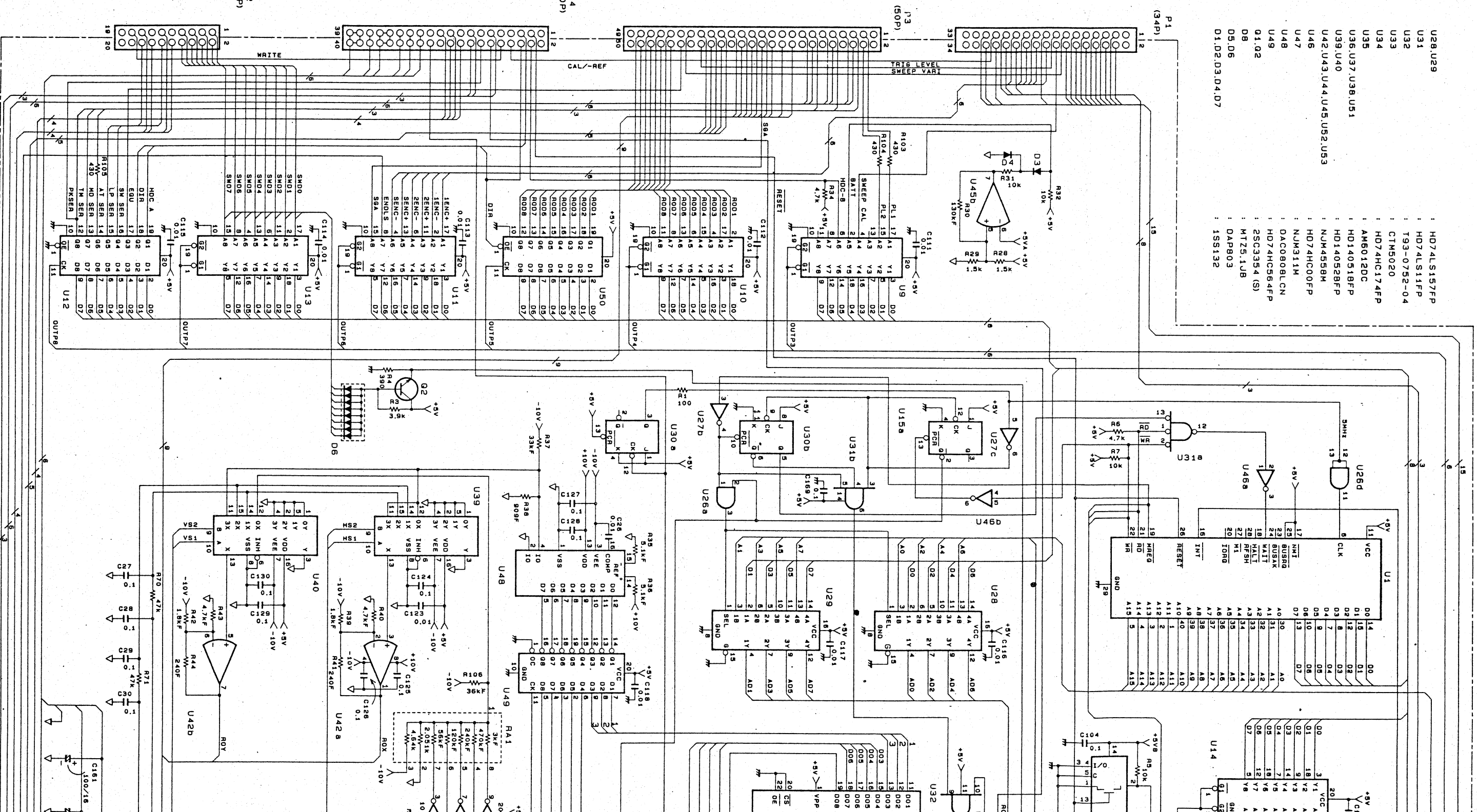
GND	PL1	GND	PL2
AT SER	AT RCK	MD SER	MD RCK
MD SER	MD RCK	TM SER	TM RCK
GND	TM RCK	GND	ROX
GND	ROV	GND	X-Y
SINGLE	88A	ROU BL	RO OFF
ROU BL	RO OFF	RO BLK	GND
RO BLK	GND	2 POS1	1 POS1
1 POS1	2 VAR	2 VAR	TRIG LEVEL
H POS1	TRIG LEVEL	GND	88A
SWEEP VARI	88A	88A	88A
GND	88A	88A	88A
RO01	RO02	RO03	RO04
RO05	RO06	RO07	RO08
GND	GND	GND	GND

FROM
CONNECTION UNIT (P606)

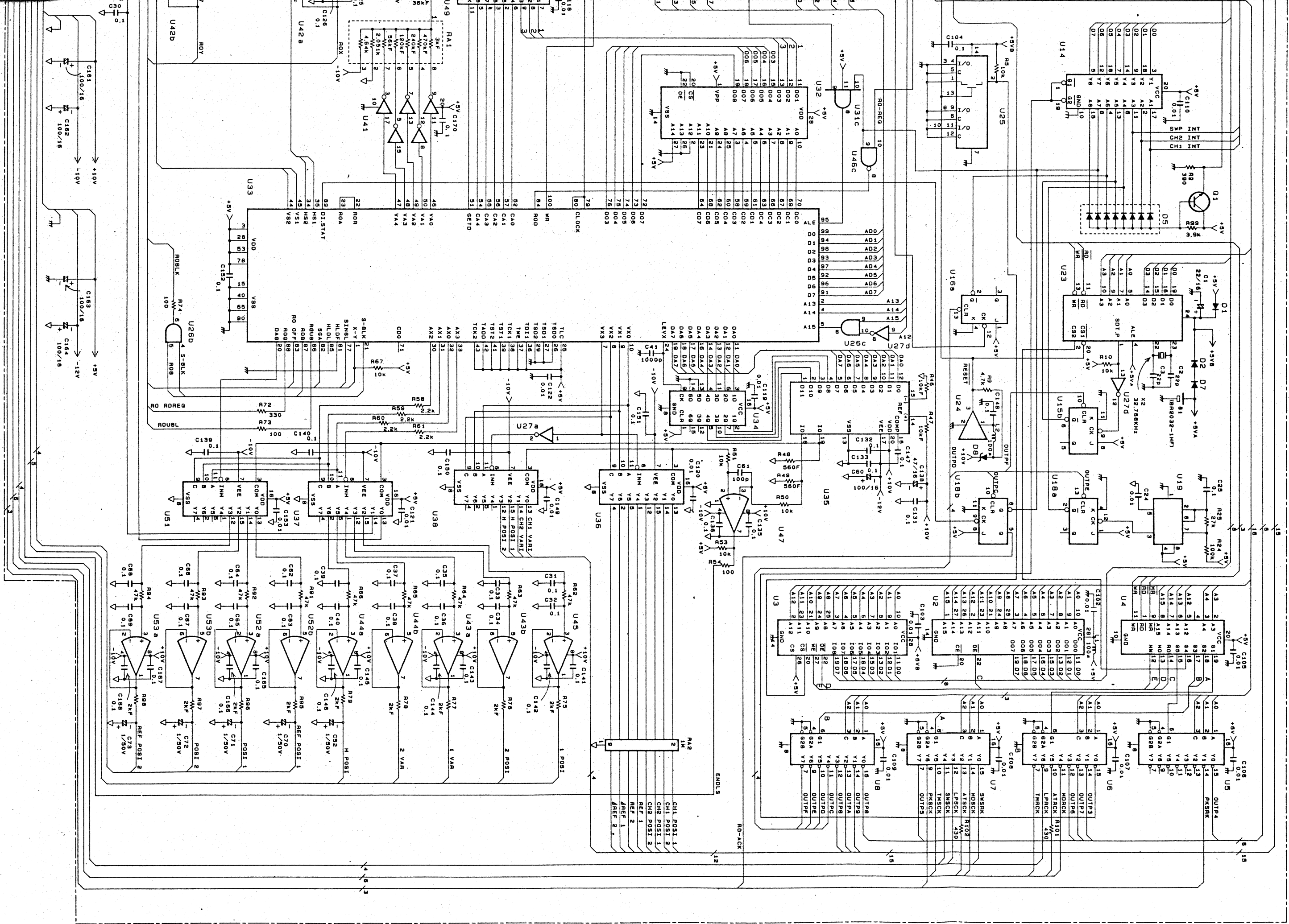
GND	RESET	GND	HDC-B
HDC-A	DIR	CAL/-REF	WRITE
GND	WRITE	RO-ACK	RO-RED
RO-ACK	RO-RED	PK-SCK	PK-SRK
PK-SCK	PK-SRK	POS1 1	POS1 2
REF POS1 1	REF POS1 2	GND	10MHz
GND	10MHz	GND	+10V
+10V	+10V	-10V	-10V
-10V	-10V	+5V	+5V
+5V	+5V	-12V	-12V
-12V	-12V	GND	GND
GND	GND	GND	GND

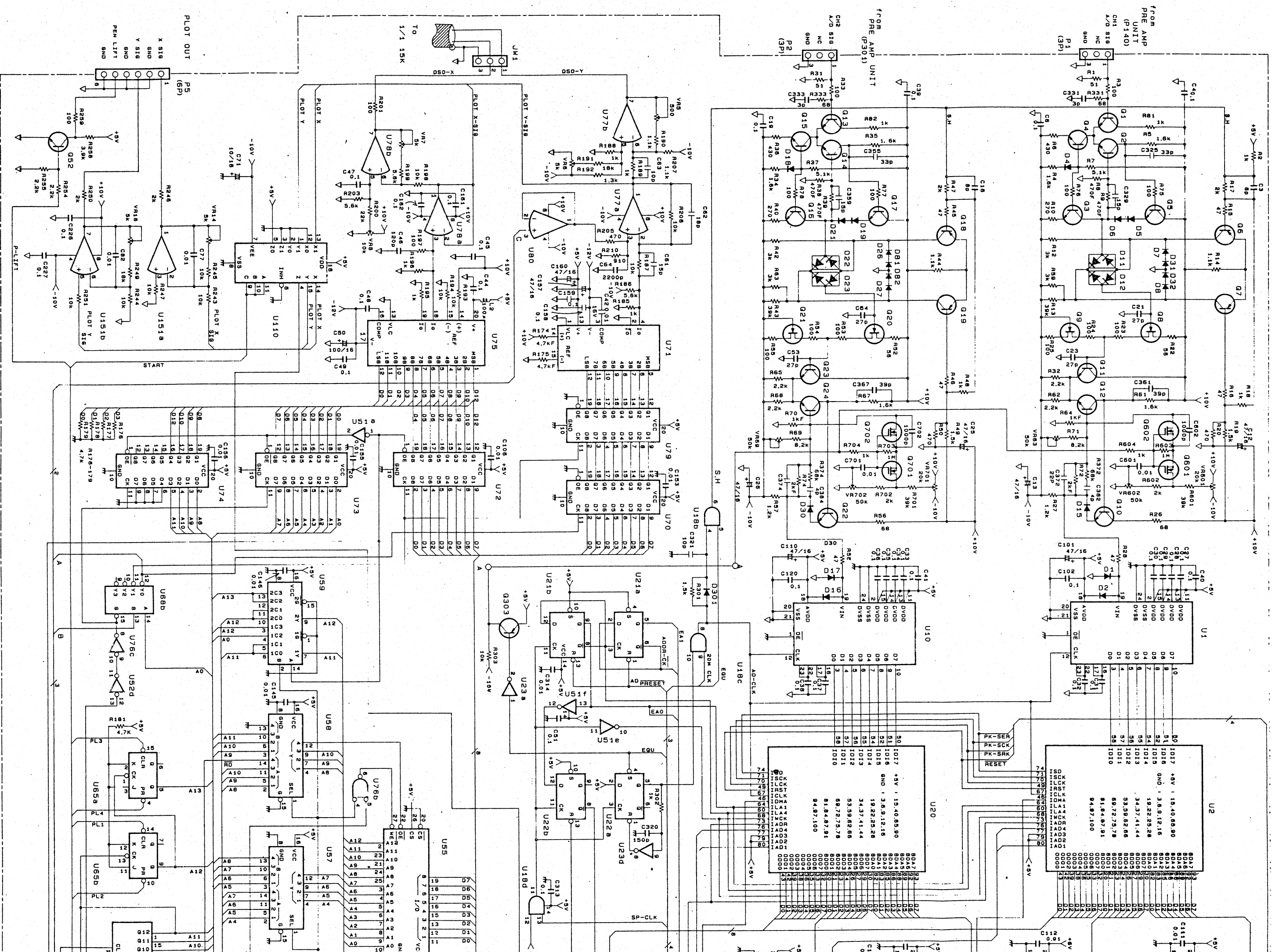
FROM
PANEL SW UNIT
(P2)

SM00	SM01	SM02	SM03
SM04	SM05	SM06	SM07
GND	SM RCK	SM RCK	SM RCK
SM SCK	SM SCK	SM SCK	SM SCK
GND	LP RCK	LP RCK	LP RCK
LP SCK	LP SCK	LP SCK	LP SCK
WRITE	WRITE	WRITE	WRITE
+5V	+5V	+5V	+5V



SCHEMATIC DIAGRAM





01. 02. 04. 010. 013. 014. 015. 022. 032
03. 05. 016. 017
06. 07. 018. 019
08. 09. 020. 021
011. 012. 023. 024
0303
0601. 0602. 0701. 0702
01. 010
02. 020
03. 030
04. 040
05. 050
06. 060
07. 070
08. 080
09. 090
10. 100
11. 110
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96. 960
97. 970
98. 980
99. 990
100. 1000

- 25C354 (S)
25C377 (D)
25A1206 (K)
25K241 (V)
25C2785 (F)
25A1565
25K583
CXD1175AP
DTM6010
CKX5853P-35
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HD74HC138FP
SN74AS08N
SN74AS74N
SN74AS04N
SN74ALS04N
HD74HC161FP
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HD74HC08FP
HD74HC112FP
HD74HC45FP
MB8464-10LL-FP
HD74HC153FP
HD74HC4040FP
HD74HC592FP
HD74HC574FP
HD74HC595FP
HD74HC139FP
DAC0800LCN
AM6012DC
HD74HC32FP
NJM072M
NJM4558M
HD140538FP
HD140538FP
15S132
MA700
H5M88AS

FROM CONNECTION UNIT (P607)

P3 (50P)

P4 (40P)

FROM CONNECTION UNIT (P608)

P4 (40P)

FROM CONNECTION UNIT (P609)

P4 (40P)

FROM CONNECTION UNIT (P610)

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FROM CONNECTION UNIT (P611)

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P4 (40P)

FROM CONNECTION UNIT (P727)

P4 (40P)

FROM CONNECTION UNIT (P728)

P4 (40P)

FROM CONNECTION UNIT (P729)

P4 (40P)

FROM CONNECTION UNIT (P730)

P4 (40P)

FROM CONNECTION UNIT (P731)

DCS-8200 UNIT

* * * P A R T S L I S T * * *

Y70-1720-00

REF. NO	PARTS NO	NAME & DESCRIPTION
	A01-1246-02	CASE, TOP
	A01-1247-02	CASE, BOTTOM
	A11-0504-02	CHASSIS, FOR UNIT
	A11-0505-02	CHASSIS, FOR UNIT
	A13-0914-02	FRAME, LEFT
	A13-0964-02	FRAME, CENTER
	A13-0965-02	FRAME, TOP
	A13-0966-02	FRAME, BOTTOM
	A13-0967-02	FRAME, FRONT & TOP
	A13-0968-02	FRAME, FRONT & BOTTOM
	A21-1181-12	DECORATIVE PANEL
	A63-0035-23	PANEL ASS'Y
	A83-0024-02	REAR PANEL
	B11-0518-04	FILTER
	B30-0952-05	LAMP (T4.2 8V 0.15A)
	B30-0997-05	LAMP ASS'Y; SCALE ILLUMINATION
	B39-0407-04	SPACER
	B42-3699-04	SERIAL NO. PLATE
	B63-0058-00	INSTRUCTION MANUAL; JAPANESE
	B63-0059-00	INSTRUCTION MANUAL; ENGLISH
	B63-0113-00	GP-IB MANUAL; JAPANESE
	B63-0114-00	GP-IB MANUAL; ENGLISH
	B73-0004-13	NAME PLATE; MODEL NO.
	D21-0915-04	EXTENSION SHAFT
	D22-0501-04	JOINT & COUPLING
	E04-0259-05	BNC RECEPTACLE
	E18-0365-05	AC SELECTOR WITH 6X30MM FUSE
	E18-0366-15	AC SELECTOR WITH 5X20MM FUSE
	E21-0660-04	TERMINAL, CAL
	E21-0667-05	METAL TERMINAL
	E23-0513-05	EARTH LUG, BNC
	E23-0552-04	EARTH TERMINAL
	E30-1644-15	BS POWER CORD
	E30-1818-05	JIS POWER CORD SET
	E30-1819-15	CEE POWER CORD SET
	E30-1820-05	UL/CSA POWER CORD SET
	E30-1821-05	SAA POWER CORD SET
	E31-0717-25	WIRE ASS'Y; INLET TO GND
	E38-0331-05	WIRE ASS'Y; EXT. TRIG TO P401
	E38-0335-05	WIRE ASS'Y; P202 TO P201
	E38-0336-05	WIRE ASS'Y; P140 TO P2
	E38-0337-05	WIRE ASS'Y; P301 TO P1
	E38-0344-15	WIRE ASS'Y; PEN OUT TO P6
	E38-0346-05	WIRE ASS'Y; P403 TO P402
	E38-0347-05	WIRE ASS'Y; P604 TO P202
	E38-0348-05	WIRE ASS'Y; P611 TO P2
	E38-0349-05	WIRE ASS'Y; RS-232C TO P602
	E38-0350-15	WIRE ASS'Y; GP-IB TO P2
	E38-0361-15	WIRE ASS'Y; P82 TO TRANS.
	E38-0363-05	WIRE ASS'Y; P402 TO P6
	E38-0364-05	WIRE ASS'Y; P401 TO P7
	E38-0488-05	WIRE ASS'Y; P246 TO P101
	E38-0563-05	WIRE ASS'Y; P501/502/503 TO
	F05-1023-05	FUSE(6X30MM) 1A/250V
	F06-1022-05	FUSE(5X20MM) T1A/250V
	F09-0512-04	EDGING
	F10-1643-03	SHIELD PLATE
	F10-1644-04	SHIELD PLATE
	F10-1647-03	SHIELD PLATE; FOR PRE AMP UNIT

* * * P A R T S L I S T * * *

Y70-1720-00

REF. NO	PARTS NO	NAME & DESCRIPTION
	F10-1648-03	SHIELD PLATE;FOR ATT UNIT
	F11-1206-13	CRT SHIELD
	F15-0733-04	FELT (CRT SHIELD)
	F20-0639-04	INSULATOR
	F20-0658-04	INSULATED SHEET
	F20-0695-04	INSULATED SHEET
	F29-0519-03	INSULATED SHEET
	F31-0607-04	BRACKET, FOR HANDLE
	F51-0012-05	FUSE (6.3X32MM) T0.25A/250V
	H10-2828-22	FOAMED STYRENE PAD (FRONT)
	H10-2829-12	FOAMED STYRENE PAD (REAR)
	H20-1727-04	VINYL COVER
	H53-0042-04	CARTON BOX
	J02-0089-05	RUBBER FOOT (REAR)
	J02-0512-05	FOOT (SMALL)
	J02-0515-04	TILT STAND
	J11-0046-05	CABLE CLAMP
	J19-1651-14	BRACKET
	J19-1652-04	BRACKET FOR P.C.B.
	J19-1653-23	HOLDER FOR CRT
	J21-2573-04	HOLDER FOR LEG
	J21-4594-33	BRACKET, FOR CRT
	J21-4753-04	BRACKET
	J21-4754-04	BRACKET
	J21-4756-04	BRACKET
	J21-4757-04	BRACKET
	J21-4762-14	BRACKET
	J30-0623-04	SPACER
	J31-0604-04	SPACER
	J39-0536-05	SPACER
	J42-0522-04	BUSHING (FREE)
	J59-0403-05	NYLON RIVET (ILLUMI)
	J61-0516-05	SUPPORT
	K01-0545-05	HANDLE
	K21-0919-04	KNOB; A
	K21-0920-04	KNOB; B
	K21-0921-04	KNOB; C
	K23-0814-04	KNOB; D
	K27-0538-04	BUTTON; POWER SWITCH
	K27-0543-04	BUTTON (39 USED)
	L01-9968-15	POWER TRANSFORMER
	L39-0531-05	ROTATION COIL
	L76-0120-05	DELAY LINE
	N08-0611-04	SCREW (FOR CORD WRAP)
	N09-0623-04	SCREW, SEMS PAN HD M3X8
	N09-0654-05	SCREW, SEMS PAN HD M4X8
	N09-0739-05	SCREW, SEMS BINDING TAPTITE 3X8
	N09-0748-04	SCREW, SEMS PAN HD M4X12
	N09-0757-05	SCREW, SEMS BINDING TAPTITE 3X6
	N09-0799-05	SCREW, SEMS BINDING TAPTITE 3X12
	N09-0800-05	SCREW, SEMS PAN HD M3X14
	N10-2030-41	NUT, HEX M3
	N16-0030-41	SPRING WASHER
	N17-1030-41	LOCK WASHER M3
	N19-0191-05	WASHER NONMETAL
	N30-3006-41	SCREW, PAN HD M3X6
	N30-3010-41	SCREW, PAN HD M3X10
	N32-3006-41	SCREW, FLAT HD M3X6
	N32-4006-41	SCREW, FLAT HD M4X6

* * * P A R T S L I S T * * *

Y70-1720-00

REF. NO	PARTS NO	NAME & DESCRIPTION
	N88-3008-41	SCREW, FLAT HD TAPTITE 3X8
	N89-3006-41	SCREW, BINDING TAPTITE 3X6
	T40-0417-15	FAN
	W01-0503-04	REAR RUBBER FOOT/CORD WRAP
	W03-2307-05	R/O PROBE (PC-33)
	X66-1120-00	PANEL VR UNIT
	X66-1200-00	PANEL SW UNIT
	X68-1480-01	POWER SUPPLY UNIT
	X69-1220-00	CONNECTION UNIT
	X73-1930-00	PRE AMP UNIT
	X74-1550-00	HORIZONTAL UNIT
	X75-1200-00	ATT UNIT
	X77-1720-00	READOUT UNIT
	X77-1730-00	STORAGE UNIT
	X78-1080-00	A/D CONVERTER UNIT
	X80-1090-02	FINAL UNIT
	X80-1230-00	AC FILTER UNIT
	150VTM31	CRT

PANEL VR UNIT

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PARTS LIST

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(X66-1120-00)

REF. NO	PARTS NO	NAME & DESCRIPTION			
	J73-0114-12	PCB (UNMOUNTED)			
C1	CK45FB1H102K	CAP. CERAMIC	1000P	10%	50V
C2	CK45FB1H102K	CAP. CERAMIC	1000P	10%	50V
C3	CK45FB1H102K	CAP. CERAMIC	1000P	10%	50V
C4	CK45FB1H102K	CAP. CERAMIC	1000P	10%	50V
C5	CK45FB1H102K	CAP. CERAMIC	1000P	10%	50V
C6	CK45FB1H102K	CAP. CERAMIC	1000P	10%	50V
C7	CK45FB1H102K	CAP. CERAMIC	1000P	10%	50V
C8	CK45FB1H102K	CAP. CERAMIC	1000P	10%	50V
C9	CK45FB1H102K	CAP. CERAMIC	1000P	10%	50V
C10	CK45FB1H102K	CAP. CERAMIC	1000P	10%	50V
C11	CK45FB1H102K	CAP. CERAMIC	1000P	10%	50V
C12	CK45FB1H102K	CAP. CERAMIC	1000P	10%	50V
C13	CK45FB1H102K	CAP. CERAMIC	1000P	10%	50V
C31	C91-1315-05	CAP. CERAMIC	0.1	80/-10%	50V
C32	C91-1315-05	CAP. CERAMIC	0.1	80/-10%	50V
C33	C91-1315-05	CAP. CERAMIC	0.1	80/-10%	50V
C101	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C102	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C103	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C104	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C105	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C106	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C107	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C108	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C109	NO USE				
C110	CE04EW1C470M	CAP. ELECTRO	47	20%	16V
C111	CE04EW1C470M	CAP. ELECTRO	47	20%	16V
C112	CE04EW1C470M	CAP. ELECTRO	47	20%	16V
D32	1SS132	DIODE			
JL901	E38-0446-05	WIRE ASS'Y			
JW1	E38-0357-05	WIRE ASS'Y			
R1	RN14BK2C1002F	RES. METAL FILM	10K	1%	1/6W
R2	RN14BK2C2701F	RES. METAL FILM	2.7K	1%	1/6W
R3	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R11	RD14BB2C513J	RES. CARBON	51K	5%	1/6W
R12	RD14BB2C513J	RES. CARBON	51K	5%	1/6W
R13	RD14BB2C513J	RES. CARBON	51K	5%	1/6W
R14	RD14BB2C513J	RES. CARBON	51K	5%	1/6W
R15	RD14BB2C513J	RES. CARBON	51K	5%	1/6W
R16	RD14BB2C513J	RES. CARBON	51K	5%	1/6W
R34	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R35	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R36	RD14BB2C105J	RES. CARBON	1M	5%	1/6W
R37	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R38	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R39	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R80	RD14BB2C152J	RES. CARBON	1.5K	5%	1/6W
R81	RD14BB2C152J	RES. CARBON	1.5K	5%	1/6W
R82	RD14BB2C152J	RES. CARBON	1.5K	5%	1/6W

* * * P A R T S L I S T * * *

X66-1200-00

REF. NO	PARTS NO	NAME & DESCRIPTION
S19	S40-2525-05	SWITCH
S20	S40-2525-05	SWITCH
S21	S40-2525-05	SWITCH
S22	S40-2525-05	SWITCH
S23	S40-2525-05	SWITCH
S24	NO USE	
S25	S40-2525-05	SWITCH
S26	S40-2525-05	SWITCH
S27	S40-2525-05	SWITCH
S28	S40-2525-05	SWITCH
S29	S40-2525-05	SWITCH
S30	S40-2525-05	SWITCH
S31	S40-2525-05	SWITCH
S32	S40-2525-05	SWITCH
S33	S40-2525-05	SWITCH
S34	S40-2525-05	SWITCH
S35	S40-2525-05	SWITCH
S36	S40-2525-05	SWITCH
S37	S40-2525-05	SWITCH
S38	S40-2525-05	SWITCH
S39	NO USE	
S40	S40-2525-05	SWITCH
S41	S40-2525-05	SWITCH
S42	S40-2525-05	SWITCH
S43	S40-2525-05	SWITCH
S44	S40-2525-05	SWITCH
S45	NO USE	
S46	S40-2525-05	SWITCH
S47	S40-2525-05	SWITCH
S48	S40-2525-05	SWITCH
U101	HD74HC595FP	IC, 8-BIT SHIFT REGISTER/LATCH
U102	HD74HC595FP	IC, 8-BIT SHIFT REGISTER/LATCH
U103	HD74HC595FP	IC, 8-BIT SHIFT REGISTER/LATCH
U104	HD74HC595FP	IC, 8-BIT SHIFT REGISTER/LATCH
U105	HD74HC595FP	IC, 8-BIT SHIFT REGISTER/LATCH
U106	HD74HC595FP	IC, 8-BIT SHIFT REGISTER/LATCH
U107	HD74HC595FP	IC, 8-BIT SHIFT REGISTER/LATCH
U108	HD74HC595FP	IC, 8-BIT SHIFT REGISTER/LATCH

PANEL SW UNIT

* * * P A R T S L I S T * * *

(X66-1200-00)

REF. NO	PARTS NO	NAME & DESCRIPTION			
	J73-0113-03	PCB (UNMOUNTED)			
C103	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C104	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C105	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C106	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C107	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C108	NO USE				
C109	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C110	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C111	CE04EW1C101M	CAP. ELECTRO	100	20%	16V
D1	1SS132	DIODE			
D2	1SS132	DIODE			
D3	1SS132	DIODE			
D4	1SS132	DIODE			
D5	1SS132	DIODE			
D6	1SS132	DIODE			
D11	B30-0964-05	LED			
D12	B30-0964-05	LED			
D13	B30-0964-05	LED			
D14	B30-0964-05	LED			
D15	B30-0964-05	LED			
D16	B30-0964-05	LED			
D17	B30-0964-05	LED			
D18	B30-0964-05	LED			
D19	B30-0964-05	LED			
D20	B30-0964-05	LED			
D21	B30-0964-05	LED			
D22	B30-0964-05	LED			
D23	B30-0964-05	LED			
JW1	E38-0356-05	WIRE ASS'Y			
R1	R90-0653-05	RES. NETWORK	8X10K	5%	
R2	NO USE				
R3	R90-0614-05	RES. NETWORK	8X390	5%	
R4	R90-0614-05	RES. NETWORK	8X390	5%	
R5	R90-0639-05	RES. NETWORK	6X390	5%	
R6	R90-0639-05	RES. NETWORK	6X390	5%	
R7	R90-0614-05	RES. NETWORK	8X390	5%	
R8	R90-0614-05	RES. NETWORK	8X390	5%	
R9	R90-0614-05	RES. NETWORK	8X390	5%	
S1	S40-2525-05	SWITCH			
S2	S40-2525-05	SWITCH			
S3	S40-2525-05	SWITCH			
S4	S40-2525-05	SWITCH			
S5	S40-2525-05	SWITCH			
S9	S40-2525-05	SWITCH			
S10	NO USE				
S11	S40-2525-05	SWITCH			
S12	S40-2525-05	SWITCH			
S13	S40-2525-05	SWITCH			
S14	S40-2525-05	SWITCH			
S17	S40-2525-05	SWITCH			
S18	S40-2525-05	SWITCH			

* * * P A R T S L I S T * * *

X66-1120-00

REF. NO	PARTS NO	NAME & DESCRIPTION
R83	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R84	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R85	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R86	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R87	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R88	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
RA2	R90-0652-05	RES. NETWORK 6X10K 5%
S1	W02-0498-05	ENCORDER SWITCH
S2	W02-0498-05	ENCORDER SWITCH
S3	W02-0498-05	ENCORDER SWITCH
U16	HD74LS107AFP	IC, QUAD JK-FF WITH CLEAR
U17	HD74LS107AFP	IC, QUAD JK-FF WITH CLEAR
U20	HD74HC08FP	IC, QUAD 2-INPUT AND GATE
U21	HD74HC08FP	IC, QUAD 2-INPUT AND GATE
U22	HD74HC7266FP	IC, QUAD 2-INPUT NOR GATE
U108	NJM4558M	IC, DUAL OP-AMP
U109	NJM4558M	IC, DUAL OP-AMP
VR1	R10-3504-15	ENDLESS VOLUME 2X10K B
VR2	R10-3504-15	ENDLESS VOLUME 2X10K B
VR3	R10-3504-15	ENDLESS VOLUME 2X10K B
VR4	R10-3504-15	ENDLESS VOLUME 2X10K B
VR5	R10-3504-15	ENDLESS VOLUME 2X10K B
VR6	R05-3514-05	VOLUME 20K B

POWER SUPPLY UNIT * * * P A R T S L I S T * * *

(X68-1480-01)

REF. NO	PARTS NO	NAME & DESCRIPTION			
	F01-0813-05	HEAT SINK (CONVERTER)			
	F01-0858-03	HEAT SINK (POWER TR)			
	F10-1601-04	SHIELD PLATE			
	F15-0727-04	HOLDER (NEON LAMP)			
	J25-5182-32	PCB (UNMOUNTED)			
	N09-0623-04	SCREW, SEMS PAN HD M3X8			
	N09-0731-05	SCREW, SEMS PAN HD M3X12			
	N14-0626-04	NUT			
	R92-0150-05	JUMPING RES. ZERO OHM (10MM)			
	W02-0431-05	HIGH VOLTAGE BLOCK			
C1	C90-0970-05	CAP. ELECTRO	3900	20%	25V
C2	C90-0970-05	CAP. ELECTRO	3900	20%	25V
C3	NO USE				
C4	CE04W2E470M	CAP. ELECTRO	47	20%	250V
C5	C90-0969-05	CAP. ELECTRO	560	20%	100V
C6	CE04EW1E101M	CAP. ELECTRO	100	20%	25V
C7	CE04EW1E101M	CAP. ELECTRO	100	20%	25V
C8	CE04EW1E101M	CAP. ELECTRO	100	20%	25V
C9	CE04EW1A221M	CAP. ELECTRO	220	20%	10V
C10	CE04W2C010M	CAP. ELECTRO	1	20%	160V
C11	CE04EW2A100M	CAP. ELECTRO	10	20%	100V
C12	CE04EW1V221M	CAP. ELECTRO	220	20%	35V
C13	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C14	CK45FB2H472K	CAP. CERAMIC	4700P	10%	500V
C15	CC45FCH2H010C	CAP. CERAMIC	1P	0.25P	500V
C16	CC45FCH2H020C	CAP. CERAMIC	2P	0.25P	500V
C17	CE04W2C2R2M	CAP. ELECTRO	2.2	20%	160V
C18	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C19	CK45FB2H472K	CAP. CERAMIC	4700P	10%	500V
C20	CC45FCH2H010C	CAP. CERAMIC	1P	0.25P	500V
C21	CC45FCH2H010C	CAP. CERAMIC	1P	0.25P	500V
C22	C91-0571-05	CAP. CERAMIC	0.01		2KV
C23	C91-0571-05	CAP. CERAMIC	0.01		2KV
C24	CK45FB2H102K	CAP. CERAMIC	1000P	10%	500V
C25	C91-0571-05	CAP. CERAMIC	0.01		2KV
C26	CK45FB2H102K	CAP. CERAMIC	1000P	10%	500V
C27	C91-0571-05	CAP. CERAMIC	0.01		2KV
C28	C91-0571-05	CAP. CERAMIC	0.01		2KV
C29	C91-0571-05	CAP. CERAMIC	0.01		2KV
C30	C91-0571-05	CAP. CERAMIC	0.01		2KV
C31	CK45E3D102P	CAP. CERAMIC	1000P		2KV
C32	CQ92FM1H154K	CAP. MYLAR	0.15	10%	50V
C33	CQ92FM1H154K	CAP. MYLAR	0.15	10%	50V
C34	CK45FB1H222K	CAP. CERAMIC	2200P	10%	50V
C35	CK45FB1H472K	CAP. CERAMIC	4700P	10%	50V
C36	CE04EW1E102M	CAP. ELECTRO	1000	20%	25V
C37	CE04EW1E101M	CAP. ELECTRO	100	20%	25V
C38	CC45FCH1H220J	CAP. CERAMIC	22P	5%	50V
C41	CQ92FM1H103J	CAP. MYLAR	0.01	5%	50V
C42	CE04W2C2R2M	CAP. ELECTRO	2.2	20%	160V
C43	CE04W2C2R2M	CAP. ELECTRO	2.2	20%	160V
C44	CE04EW1E101M	CAP. ELECTRO	100	20%	25V
C45	CE04EW1E101M	CAP. ELECTRO	100	20%	25V
C46	CE04EW1E101M	CAP. ELECTRO	100	20%	25V
C47	C91-0571-05	CAP. CERAMIC	0.01		2KV
C48	C91-0571-05	CAP. CERAMIC	0.01		2KV
C51	CE04EW1E102M	CAP. ELECTRO	1000	20%	25V

* * * P A R T S L I S T * * *

X68-1480-01

REF. NO	PARTS NO	NAME & DESCRIPTION			
C52	NO USE				
C53	CK45FB2H101K	CAP. CERAMIC	100P	10%	500V
C54	CK45FB2H472K	CAP. CERAMIC	4700P	10%	500V
C57	CE04HW1H010M	CAP. ELECTRO	1	20%	50V
C937	CE04EW1E102M	CAP. ELECTRO	1000	20%	25V
D1	S4VB40F1	DIODE, BRIDGE			
D2	NO USE				
D3	S1VB40	DIODE, BRIDGE			
D6	MTZ24JC	DIODE, ZENER	23.72V		
D7	MTZ10JC	DIODE, ZENER	9.95V		
D8	MTZ5.1JB	DIODE, ZENER	5.07V		
D9	MTZ10JC	DIODE, ZENER	9.95V		
D10	MTZ5.1JB	DIODE, ZENER	5.07V		
D11	1SS132	DIODE			
D12	1SS132	DIODE			
D13	1SS83	DIODE			
D14	1SS83	DIODE			
D15	1SR35-200A	DIODE			
D16	1SR35-200A	DIODE			
D17	1SS83	DIODE			
D18	1SS83	DIODE			
D19	1SR35-200A	DIODE			
D20	1SR35-200A	DIODE			
D21	1SS132	DIODE			
D22	1SS132	DIODE			
D23	1SS132	DIODE			
D26	1SS132	DIODE			
D27	1SS132	DIODE			
D28	1SS83	DIODE			
D29	1SS83	DIODE			
D901	1SS132	DIODE			
L1	L40-1011-13	FERRI INDUCTOR	100UH	10%	
L2	L40-1011-13	FERRI INDUCTOR	100UH	10%	
L3	L40-1021-03	FERRI INDUCTOR	1MH	10%	
L901	L40-1545-06	FERRI INDUCTOR	150MH	5%	
NL1	NE-2B	NEON LAMP			
NL2	NE-2B	NEON LAMP			
NL3	NE-2B	NEON LAMP			
NL4	NE-2B	NEON LAMP			
P9	E40-3241-05	PIN CONNECTOR	6P		
P26	E40-3237-05	PIN CONNECTOR	2P		
P27	E40-3239-05	PIN CONNECTOR	4P		
P41	E40-3241-05	PIN CONNECTOR	6P		
P44	E40-0503-05	PIN CONNECTOR	5P		
P45	NO USE				
P46	E40-3237-05	PIN CONNECTOR	2P		

* * * P A R T S L I S T * * *

X68-1480-01

REF. NO	PARTS NO	NAME & DESCRIPTION			
P47	E40-3237-05	PIN CONNECTOR	2P		
P48	E40-3237-05	PIN CONNECTOR	2P		
P49	E40-3237-05	PIN CONNECTOR	2P		
P50	E40-3239-05	PIN CONNECTOR	4P		
P51	NO USE				
P52	E40-3239-05	PIN CONNECTOR	4P		
P55	E40-5068-05	PIN CONNECTOR	11P		
Q1	2SB1133(S)	TR. SI, PNP			
Q2	2SD1666(S)	TR. SI, NPN			
Q3	2SB1133(S)	TR. SI, PNP			
Q4	2SC3749(N)	TR. SI, NPN			
Q5	2SC2271(D)	TR. SI, NPN			
Q6	2SC3749(N)	TR. SI, NPN			
Q7	2SC2271(D)	TR. SI, NPN			
Q8	2SD1666(S)	TR. SI, NPN			
Q9	2SA1208(S)	TR. SI, PNP			
Q10	2SC2910(S)	TR. SI, NPN			
Q11	2SA1210(S)	TR. SI, PNP			
Q12	2SC2912(S)	TR. SI, NPN			
Q13	2SA1005(K)	TR. SI, PNP			
Q14	2SA1175(F)	TR. SI, PNP			
Q15	2SD613(E)	TR. SI, NPN			
Q16	2SC2271(D)	TR. SI, NPN			
Q17	2SC1384(R)	TR. SI, NPN			
Q18	2SA684(R)	TR. SI, PNP			
R1	R92-1402-05	RES. SPECIAL POWER	24	5%	2W
R2	RD14BB2C221J	RES. CARBON	220	5%	1/6W
R3	RD14BB2C221J	RES. CARBON	220	5%	1/6W
R4	R92-1402-05	RES. SPECIAL POWER	24	5%	2W
R5	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R6	RN14BK2C2002F	RES. METAL FILM	20K	1%	1/6W
R7	RN14BK2C2002F	RES. METAL FILM	20K	1%	1/6W
R8	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R9	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R10	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R11	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R12	NO USE				
R13	RD14BB2C221J	RES. CARBON	220	5%	1/6W
R14	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R15	RN14BK2C1002F	RES. METAL FILM	10K	1%	1/6W
R16	RN14BK2C2002F	RES. METAL FILM	20K	1%	1/6W
R17	R92-1404-05	RES. SPR2L15	4.7K	5%	2W
R18	R92-1405-05	RES. SPR1/2L10	18K	5%	1/2W
R19	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R20	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R21	RN14BK2C2403F	RES. METAL FILM	240K	1%	1/6W
R22	RN14BK2C2002F	RES. METAL FILM	20K	1%	1/6W
R23	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R24	R92-1403-05	RES. SPR2L15	1K	5%	2W
R25	R92-1406-05	RES. SPR1/2L10	13K	5%	1/2W
R26	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R27	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R28	RN14BK2C1303F	RES. METAL FILM	130K	1%	1/6W
R29	RN14BK2C2002F	RES. METAL FILM	20K	1%	1/6W
R30	RD14BB2C103J	RES. CARBON	10K	5%	1/6W

* * * P A R T S L I S T * * *

X68-1480-01

REF. NO	PARTS NO	NAME & DESCRIPTION			
R33	RD14BB2C471J	RES. CARBON	470	5%	1/6W
R34	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R35	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W
R36	RD14BB2C124J	RES. CARBON	120K	5%	1/6W
R37	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R38	RD14BB2C683J	RES. CARBON	68K	5%	1/6W
R39	RD14BB2C114J	RES. CARBON	110K	5%	1/6W
R40	RD14BB2C912J	RES. CARBON	9.1K	5%	1/6W
R41	RD14BB2E470J	RES. CARBON	47	5%	1/4W
R42	RD14BB2C334J	RES. CARBON	330K	5%	1/6W
R43	RD14BB2C823J	RES. CARBON	82K	5%	1/6W
R44	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W
R45	RD14BB2C124J	RES. CARBON	120K	5%	1/6W
R46	RD14BB2C751J	RES. CARBON	750	5%	1/6W
R47	RD14BB2C334J	RES. CARBON	330K	5%	1/6W
R48	RD14BB2C683J	RES. CARBON	68K	5%	1/6W
R49	RD14BB2C152J	RES. CARBON	1.5K	5%	1/6W
R50	RD14BB2C113J	RES. CARBON	11K	5%	1/6W
R51	RD14BB2E470J	RES. CARBON	47	5%	1/4W
R52	R92-1034-05	RES. METAL FILM	47M	5%	1/2W
R53	R92-1034-05	RES. METAL FILM	47M	5%	1/2W
R54	R92-1125-05	RES. METAL FILM	7.5M	1%	1W
R55	R92-1125-05	RES. METAL FILM	7.5M	1%	1W
R56	RN14BK2C1003F	RES. METAL FILM	100K	1%	1/6W
R57	RD14BB2C104J	RES. CARBON	100K	5%	1/6W
R58	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R59	RD14BB2C562J	RES. CARBON	5.6K	5%	1/6W
R60	RD14BB2C821J	RES. CARBON	820	5%	1/6W
R61	NO USE				
R62	R92-1153-05	RES. METAL FILM	5.1M	5%	1W
R63	R92-1193-05	RES. METAL FILM	8.2M	5%	1W
R64	RD14BB2C753J	RES. CARBON	75K	5%	1/6W
R65	RD14BB2C473J	RES. CARBON	47K	5%	1/6W
R66	RD14BB2C153J	RES. CARBON	15K	5%	1/6W
R67	RD14BB2C393J	RES. CARBON	39K	5%	1/6W
R68	RD14BB2C513J	RES. CARBON	51K	5%	1/6W
R69	RD14BB2C433J	RES. CARBON	43K	5%	1/6W
R70	RD14BB2C132J	RES. CARBON	1.3K	5%	1/6W
R71	RD14BB2C182J	RES. CARBON	1.8K	5%	1/6W
R72	RD14BB2C271J	RES. CARBON	270	5%	1/6W
R73	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R74	NO USE				
R75	RD14BB2C471J	RES. CARBON	470	5%	1/6W
R76	RD14BB2C301J	RES. CARBON	300	5%	1/6W
R77	RD14BB2C362J	RES. CARBON	3.6K	5%	1/6W
R80	RD14BB2C100J	RES. CARBON	10	5%	1/6W
R81	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R82	RD14BB2C222J	RES. CARBON	2.2K	5%	1/6W
R83	RD14BB2C473J	RES. CARBON	47K	5%	1/6W
R84	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R85	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R86	RD14BB2C104J	RES. CARBON	100K	5%	1/6W
R87	RD14BB2C272J	RES. CARBON	2.7K	5%	1/6W
R901	RD14BB2C223J	RES. CARBON	22K	5%	1/6W
U1	NJM4558D	IC, DUAL OP AMP			
U2	NJM4558D	IC, DUAL OP AMP			

* * * P A R T S L I S T * * *

X68-1480-01

REF. NO	PARTS NO	NAME & DESCRIPTION
U3	NJM4558D	IC,DUAL OP AMP
U4	NJM4558D	IC,DUAL OP AMP
VR1	R12-1538-05	RES. SEMI FIXED 1KB
VR2	R12-5526-05	RES. SEMI FIXED 100KB
VR3	NO USE	
VR4	R12-8001-05	RES. SEMI FIXED 2.2MB
VR5	R12-4416-05	RES. SEMI FIXED 50KB
VR6	R12-1538-05	RES. SEMI FIXED 1KB

CONNECTION UNIT

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P A R T S L I S T

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(X69-1220-00)

REF. NO	PARTS NO	NAME & DESCRIPTION
	E38-0448-05	WIRE ASS'Y; P608 TO P602
	J73-0121-12	PCB (UNMOUNTED)
P601	E38-0358-05	WIRE ASS'Y 20P
P602	E38-0359-05	WIRE ASS'Y 34P
P603	E40-3241-05	PIN CONNECTOR 6P
P604	E40-3305-05	PIN CONNECTOR 8P
P605	E40-7214-05	PIN CONNECTOR 50P
P606	E40-7034-05	PIN CONNECTOR 40P
P607	E40-7214-05	PIN CONNECTOR 50P
P608	E40-7034-05	PIN CONNECTOR 40P
P609	E40-7034-05	PIN CONNECTOR 40P
P610	E40-7214-05	PIN CONNECTOR 50P
P611	E40-3307-05	PIN CONNECTOR 10P
P612	E40-7213-05	PIN CONNECTOR 26P
P613	E40-3239-05	PIN CONNECTOR 4P
P614	E40-3239-05	PIN CONNECTOR 4P

PRE AMP UNIT
(X73-1930-00)

* * * P A R T S L I S T * * *

REF. NO	PARTS NO	NAME & DESCRIPTION				
	J73-0116-02	PCB (UN MOUNTED)				
	212-2014-05	TUBE (PLASTIC)				
C4	CK45FF1H103Z	CAP. CERAMIC	0.01			50V
C10	CC45FCH1H680J	CAP. CERAMIC	68P	5%		50V
C16	CC45FSL1H681J	CAP. CERAMIC	680P	5%		50V
C34	CC45FCH1H070D	CAP. CERAMIC	7P	0.5P		50V
C42	CC45FCH1H221J	CAP. CERAMIC	220P	5%		50V
C50	CC45FCH1H020C	CAP. CERAMIC	2P	0.25P		50V
C78	CC45FSL1H331J	CAP. CERAMIC	330P	5%		50V
C79	CC45FCH1H070D	CAP. CERAMIC	7P	0.5P		50V
C108	CC45FCH1H180J	CAP. CERAMIC	18P	5%		50V
C125	CC45FCH1H470J	CAP. CERAMIC	47P	5%		50V
C137	CC45FCH1H120J	CAP. CERAMIC	12P	5%		50V
C145	CK45FF1H103Z	CAP. CERAMIC	0.01			50V
C166	CQ92FM1H104K	CAP. MYLAR	0.1	10%		50V
C167	CQ92FM1H104K	CAP. MYLAR	0.1	10%		50V
C168	CK45FF1H103Z	CAP. CERAMIC	0.01			50V
C204	CK45FF1H103Z	CAP. CERAMIC	0.01			50V
C210	CC45FCH1H680J	CAP. CERAMIC	68P	5%		50V
C216	CC45FSL1H681J	CAP. CERAMIC	680P	5%		50V
C234	CC45FCH1H070D	CAP. CERAMIC	7P	0.5P		50V
C242	CC45FCH1H221J	CAP. CERAMIC	220P	5%		50V
C279	CC45FSL1H331J	CAP. CERAMIC	330P	5%		50V
C293	CE04EW1C330M	CAP. ELECTRO	33	20%		16V
C301	CQ92FM1H104K	CAP. MYLAR	0.1	10%		50V
C308	CC45FCH1H180J	CAP. CERAMIC	18P	5%		50V
C325	CC45FCH1H470J	CAP. CERAMIC	47P	5%		50V
C328	CE04EW1E220M	CAP. ELECTRO	22	20%		25V
C340	CC45FCH1H150J	CAP. CERAMIC	15P	5%		50V
C345	CK45FF1H103Z	CAP. CERAMIC	0.01			50V
C366	CQ92FM1H104K	CAP. MYLAR	0.1	10%		50V
C367	CQ92FM1H104K	CAP. MYLAR	0.1	10%		50V
C368	CK45FF1H103Z	CAP. CERAMIC	0.01			50V

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P A R T S L I S T

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X73-1930-00

REF. NO	PARTS NO	NAME & DESCRIPTION			
C372	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C377	CG45FCH1H101J	CAP. CERAMIC	100P	5%	50V
C401	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C402	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C403	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C404	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C405	CE04EW1C221M	CAP. ELECTRO	220	20%	16V
C406	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C411	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C423	C91-0502-05	CAP. POLYESTER	0.01	20%	630V
C424	CE04EW1C330M	CAP. ELECTRO	33	20%	16V
C427	CC45FCH1H220J	CAP. CERAMIC	22P	5%	50V
C430	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C501	CE04EW1C471M	CAP. ELECTRO	470	20%	16V
C502	CE04EW1C330M	CAP. ELECTRO	33	20%	16V
C503	CE04EW1C330M	CAP. ELECTRO	33	20%	16V
C504	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C505	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C506	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C507	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C508	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C509	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C510	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C511	CE04EW1C471M	CAP. ELECTRO	470	20%	16V
C512	CE04EW1C330M	CAP. ELECTRO	33	20%	16V
C513	CE04EW1C330M	CAP. ELECTRO	33	20%	16V
C514	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C515	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C516	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C517	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C518	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C519	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C520	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C521	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C522	CE04EW1C101M	CAP. ELECTRO	100	20%	16V
C601	CQ92FM1H102K	CAP. MYLAR	1000P	10%	50V
C602	NO USE				
C603	CC45FCH1H220J	CAP. CERAMIC	22P	5%	50V
C611	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C612	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C613	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C614	NO USE				
C615	CC45FCH1H151J	CAP. CERAMIC	150P	5%	50V
C616	C91-1315-05	CAP. CERAMIC	0.1	80/-10%	50V
C617	C91-1315-05	CAP. CERAMIC	0.1	80/-10%	50V
C623	CC45FCH1H220J	CAP. CERAMIC	22P	5%	50V
C624	NO USE				
C625	CC45FCH1H151J	CAP. CERAMIC	150P	5%	50V

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X73-1930-00

REF. NO	PARTS NO	NAME & DESCRIPTION
C630	CC45FCH1H330J	CAP. CERAMIC 33P 5% 50V
C650	CC45FCH1H330J	CAP. CERAMIC 33P 5% 50V
C672	CC45FCH1H101J	CAP. CERAMIC 100P 5% 50V
C701	CC45CH1H020C	CAP. CERAMIC 2P 0.25P 50V
D37	1SS132	DIODE
D80	MA700	DIODE
D81	MA700	DIODE
D82	MA700	DIODE
D83	MA700	DIODE
D102	1SS132	DIODE
D154	1SS132	DIODE
D237	1SS132	DIODE
D292	MTZ6.2JB	DIODE, ZENER 6.1V
D293	MA700	DIODE
D294	MA700	DIODE
D354	1SS132	DIODE
D385	1SS132	DIODE
D424	MTZ6.2JB	DIODE, ZENER 6.1V
JW2	E38-0333-15	WIRE ASS'Y
JW102	E38-0333-15	WIRE ASS'Y
P140	E40-3238-05	PIN CONNECTOR 3P
P202	E40-3238-05	PIN CONNECTOR 3P
P220	E40-3238-05	PIN CONNECTOR 3P
P301	E40-3238-05	PIN CONNECTOR 3P
P401	E40-3237-05	PIN CONNECTOR 2P
P402	NO USE	
P403	E40-3243-05	PIN CONNECTOR 8P
P404	E40-7215-05	PIN CONNECTOR 20P
Q1	2SC4072	TR. SI, NPN
Q2	2SC3381(GR)	TR. SI, NPN
Q6	3SK121(GR)	FET, N-CHANNEL, DUAL GATE
Q7	2SA1005(K)	TR. SI, PNP
Q8	2SA1005(K)	TR. SI, PNP
Q9	2SC2671(H)	TR. SI, NPN
Q10	2SC2671(H)	TR. SI, NPN
Q11	2SC3354(S)	TR. SI, NPN
Q12	2SA1206(K)	TR. SI, PNP
Q13	2SA1206(K)	TR. SI, PNP

* * * P A R T S L I S T * * *

X73-1930-00

REF. NO	PARTS NO	NAME & DESCRIPTION
Q14	2SA1206(K)	TR. SI, PNP
Q15	2SA1206(K)	TR. SI, PNP
Q16	2SC3779(D)	TR. SI, NPN
Q17	2SC3779(D)	TR. SI, NPN
Q18	2SC2785(F)	TR. SI, NPN
Q19	2SC2785(F)	TR. SI, NPN
Q20	2SC3354(S)	TR. SI, NPN
Q21	2SC3354(S)	TR. SI, NPN
Q22	2SC3354(S)	TR. SI, NPN
Q23	2SC3354(S)	TR. SI, NPN
Q24	2SA1206(K)	TR. SI, PNP
Q25	2SA1206(K)	TR. SI, PNP
Q26	2SA1005(K)	TR. SI, PNP
Q27	2SC3354(S)	TR. SI, NPN
Q28	2SC3354(S)	TR. SI, NPN
Q29	NO USE	
Q30	2SA1005(K)	TR. SI, PNP
Q31	2SA1005(K)	TR. SI, PNP
Q121	2SC3354(S)	TR. SI, NPN
Q122	2SC3354(S)	TR. SI, NPN
Q143	2SC3354(S)	TR. SI, NPN
Q144	2SC3354(S)	TR. SI, NPN
Q145	2SC3354(S)	TR. SI, NPN
Q151	2SC3354(S)	TR. SI, NPN
Q152	2SC2910(S)	TR. SI, NPN
Q153	2SA1175(F)	TR. SI, PNP
Q201	2SC4072	TR. SI, NPN
Q202	2SC3381(GR)	TR. SI, NPN
Q206	3SK121(GR)	FET, N-CHANNEL, DUAL GATE
Q207	2SA1005(K)	TR. SI, PNP
Q208	2SA1005(K)	TR. SI, PNP
Q209	2SC2671(H)	TR. SI, NPN
Q210	2SC2671(H)	TR. SI, NPN
Q211	2SC3354(S)	TR. SI, NPN
Q212	2SA1206(K)	TR. SI, PNP
Q213	2SA1206(K)	TR. SI, PNP
Q214	2SA1206(K)	TR. SI, PNP
Q215	2SA1206(K)	TR. SI, PNP
Q216	2SC3779(D)	TR. SI, NPN
Q217	2SC3779(D)	TR. SI, NPN
Q218	2SC3354(S)	TR. SI, NPN
Q219	2SC3354(S)	TR. SI, NPN
Q220	2SC2785(F)	TR. SI, NPN
Q221	2SC2785(F)	TR. SI, NPN
Q222	2SC3354(S)	TR. SI, NPN
Q223	2SC3354(S)	TR. SI, NPN
Q224	2SA1005(K)	TR. SI, PNP
Q230	2SA1005(K)	TR. SI, PNP
Q231	2SA1005(K)	TR. SI, PNP
Q232	2SA1206(K)	TR. SI, PNP
Q233	2SA1206(K)	TR. SI, PNP
Q321	2SC3354(S)	TR. SI, NPN

* * * P A R T S L I S T * * *

X73-1930-00

REF. NO	PARTS NO	NAME & DESCRIPTION
Q322	2SC3354(S)	TR. SI, NPN
Q343	2SC3354(S)	TR. SI, NPN
Q344	2SC3354(S)	TR. SI, NPN
Q345	2SC3354(S)	TR. SI, NPN
Q351	2SC3354(S)	TR. SI, NPN
Q352	2SC2910(S)	TR. SI, NPN
Q353	2SA1175(F)	TR. SI, PNP
Q371	2SC3354(S)	TR. SI, NPN
Q372	2SC3354(S)	TR. SI, NPN
Q381	2SC2785(F)	TR. SI, NPN
Q382	2SC2785(F)	TR. SI, NPN
Q383	2SA1175(F)	TR. SI, PNP
Q401	2SC2785(F)	TR. SI, NPN
Q402	2SC2785(F)	TR. SI, NPN
Q403	2SC2785(F)	TR. SI, NPN
Q404	2SC2785(F)	TR. SI, NPN
Q405	2SC3354(S)	TR. SI, NPN
Q406	2SC3354(S)	TR. SI, NPN
Q407	2SC3354(S)	TR. SI, NPN
Q408	2SC3354(S)	TR. SI, NPN
Q420	2SC3354(S)	TR. SI, NPN
Q421	2SK404(F)	FET, N-CHANNEL
Q422	2SC3354(S)	TR. SI, NPN
Q630	2SC3315(C)	TR. SI, NPN
Q650	2SC3315(C)	TR. SI, NPN
R2	RD14BB2C220J	RES. CARBON 22 5% 1/6W
R3	RD14BB2C221J	RES. CARBON 220 5% 1/6W
R4	RD14BB2C433J	RES. CARBON 43K 5% 1/6W
R5	RD14BB2C131J	RES. CARBON 130 5% 1/6W
R6	RD14BB2C470J	RES. CARBON 47 5% 1/6W
R7	RN14BK2C1001F	RES. METAL FILM 1K 1% 1/6W
R8	RN14BK2C1001F	RES. METAL FILM 1K 1% 1/6W
R9	RN14BK2C2700F	RES. METAL FILM 270 1% 1/6W
R10	RD14BB2C203J	RES. CARBON 20K 5% 1/6W
R11	RD14BB2C361J	RES. CARBON 360 5% 1/6W
R12	RN14BK2C2200F	RES. METAL FILM 220 1% 1/6W
R13	RN14BK2C2200F	RES. METAL FILM 220 1% 1/6W
R14	RD14BB2C470J	RES. CARBON 47 5% 1/6W
R15	RD14BB2C560J	RES. CARBON 56 5% 1/6W
R16	RD14BB2C332J	RES. CARBON 3.3K 5% 1/6W
R17	RD14BB2C391J	RES. CARBON 390 5% 1/6W
R18	NO USE	
R19	RD14BB2C112J	RES. CARBON 1.1K 5% 1/6W
R22	RN14BK2C2401F	RES. METAL FILM 2.4K 1% 1/6W
R23	RN14BK2C2401F	RES. METAL FILM 2.4K 1% 1/6W
R26	RN14BK2C2001F	RES. METAL FILM 2K 1% 1/6W
R27	RN14BK2C2001F	RES. METAL FILM 2K 1% 1/6W
R28	RN14BK2C2401F	RES. METAL FILM 2.4K 1% 1/6W

* * * P A R T S L I S T * * *

X73-1930-00

REF. NO	PARTS NO	NAME & DESCRIPTION			
R29	RN14BK2C2401F	RES. METAL FILM	2.4K	1%	1/6W
R30	RD14BB2C221J	RES. CARBON	220	5%	1/6W
R31	RD14BB2C221J	RES. CARBON	220	5%	1/6W
R32	RD14BB2C392J	RES. CARBON	3.9K	5%	1/6W
R33	RD14BB2C392J	RES. CARBON	3.9K	5%	1/6W
R34	RD14BB2C201J	RES. CARBON	200	5%	1/6W
R35	RD14BB2C821J	RES. CARBON	820	5%	1/6W
R36	RN14BK2C4701F	RES. METAL FILM	4.7K	1%	1/6W
R37	RN14BK2C2201F	RES. METAL FILM	2.2K	1%	1/6W
R38	RN14BK2C2700F	RES. METAL FILM	270	1%	1/6W
R39	RN14BK2C1201F	RES. METAL FILM	1.2K	1%	1/6W
R40	RN14BK2C1201F	RES. METAL FILM	1.2K	1%	1/6W
R41	RD14BB2C151J	RES. CARBON	150	5%	1/6W
R42	RD14BB2C333J	RES. CARBON	33K	5%	1/6W
R43	RN14BK2C3300F	RES. METAL FILM	330	1%	1/6W
R44	RN14BK2C3300F	RES. METAL FILM	330	1%	1/6W
R45	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R46	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R47	RN14BK2C5101F	RES. METAL FILM	5.1K	1%	1/6W
R48	RN14BK2C6801F	RES. METAL FILM	6.8K	1%	1/6W
R49	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R50	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R51	RD14BB2C561J	RES. CARBON	560	5%	1/6W
R54	RD14BB2C122J	RES. CARBON	1.2K	5%	1/6W
R55	RD14BB2C471J	RES. CARBON	470	5%	1/6W
R56	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R57	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R61	RN14BK2C6800F	RES. METAL FILM	680	1%	1/6W
R62	RN14BK2C6800F	RES. METAL FILM	680	1%	1/6W
R63	RN14BK2C1001F	RES. METAL FILM	1K	1%	1/6W
R64	RN14BK2C1001F	RES. METAL FILM	1K	1%	1/6W
R65	RD14BB2C222J	RES. CARBON	2.2K	5%	1/6W
R66	RD14BB2C222J	RES. CARBON	2.2K	5%	1/6W
R67	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R68	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R69	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R70	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R71	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R72	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R73	NO USE				
R74	RD14BB2C331J	RES. CARBON	330	5%	1/6W
R75	RD14BB2C331J	RES. CARBON	330	5%	1/6W
R76	NO USE				
R77	RD14BB2C272J	RES. CARBON	2.7K	5%	1/6W
R78	RD14BB2C184J	RES. CARBON	180K	5%	1/6W
R79	RD14BB2C431J	RES. CARBON	430	5%	1/6W
R80	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R81	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R82	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R83	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R84	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R85	RD14BB2C752J	RES. CARBON	7.5K	5%	1/6W
R86	RD14BB2C272J	RES. CARBON	2.7K	5%	1/6W
R87	RN14BK2C1201F	RES. METAL FILM	1.2K	1%	1/6W
R88	RN14BK2C1201F	RES. METAL FILM	1.2K	1%	1/6W
R89	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R90	RD14BB2C220J	RES. CARBON	22	5%	1/6W

* * * P A R T S L I S T * * *

X73-1930-00

REF. NO	PARTS NO	NAME & DESCRIPTION				
R91	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R92	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R93	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R94	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R95	RD14BB2C272J	RES. CARBON	2.7K	5%	1/6W	
R96	RD14BB2C272J	RES. CARBON	2.7K	5%	1/6W	
R97	NO USE					
R98	RD14BB2C391J	RES. CARBON	390	5%	1/6W	
R99	RN14BK2C1800F	RES. METAL FILM	180	1%	1/6W	
R100	RN14BK2C1800F	RES. METAL FILM	180	1%	1/6W	
R101	RN14BK2C1500F	RES. METAL FILM	150	1%	1/6W	
R102	RN14BK2C1201F	RES. METAL FILM	1.2K	1%	1/6W	
R103	RN14BK2C5101F	RES. METAL FILM	5.1K	1%	1/6W	
R104	RN14BK2C1800F	RES. METAL FILM	180	1%	1/6W	
R105	NO USE					
R106	RD14BB2C183J	RES. CARBON	18K	5%	1/6W	
R107	RD14BB2C562J	RES. CARBON	5.6K	5%	1/6W	
R108	RD14BB2C512J	RES. CARBON	5.1K	5%	1/6W	
R121	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R122	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R123	RD14BB2C122J	RES. CARBON	1.2K	5%	1/6W	
R124	RD14BB2C122J	RES. CARBON	1.2K	5%	1/6W	
R125	RD14BB2C201J	RES. CARBON	200	5%	1/6W	
R130	RD14BB2C152J	RES. CARBON	1.5K	5%	1/6W	
R131	RD14BB2C470J	RES. CARBON	47	5%	1/6W	
R132	RD14BB2C470J	RES. CARBON	47	5%	1/6W	
R133	RN14BK2C1501F	RES. METAL FILM	1.5K	1%	1/6W	
R134	RN14BK2C1301F	RES. METAL FILM	1.3K	1%	1/6W	
R135	NO USE					
R136	RD14BB2C431J	RES. CARBON	430	5%	1/6W	
R137	RD14BB2C151J	RES. CARBON	150	5%	1/6W	
R141	RN14BK2C1301F	RES. METAL FILM	1.3K	1%	1/6W	
R142	NO USE					
R143	RN14BK2C1201F	RES. METAL FILM	1.2K	1%	1/6W	
R147	RD14BB2C331J	RES. CARBON	330	5%	1/6W	
R148	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
R149	RD14BB2C470J	RES. CARBON	47	5%	1/6W	
R150	NO USE					
R151	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W	
R152	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W	
R153	RD14BB2C621J	RES. CARBON	620	5%	1/6W	
R154	RD14BB2C821J	RES. CARBON	820	5%	1/6W	
R155	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W	
R156	RD14BB2C432J	RES. CARBON	4.3K	5%	1/6W	
R157	NO USE					
R158	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
R159	RN14BK2C2002F	RES. METAL FILM	20K	1%	1/6W	
R160	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W	
R161	RN14BK2C9101F	RES. METAL FILM	9.1K	1%	1/6W	
R162	RN14BK2C1603F	RES. METAL FILM	160K	1%	1/6W	
R163	RN14BK2C5601F	RES. METAL FILM	5.6K	1%	1/6W	
R164	RD14BB2C562J	RES. CARBON	5.6K	5%	1/6W	
R165	RD14BB2C471J	RES. CARBON	470	5%	1/6W	
R166	RD14BB2C362J	RES. CARBON	3.6K	5%	1/6W	
R167	RD14BB2C513J	RES. CARBON	51K	5%	1/6W	

* * * P A R T S L I S T * * *

X73-1930-00

REF. NO	PARTS NO	NAME & DESCRIPTION			
R168	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R169	RD14BB2C182J	RES. CARBON	1.8K	5%	1/6W
R202	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R203	RD14BB2C221J	RES. CARBON	220	5%	1/6W
R204	RD14BB2C433J	RES. CARBON	43K	5%	1/6W
R205	RD14BB2C131J	RES. CARBON	130	5%	1/6W
R206	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R207	RN14BK2C1001F	RES. METAL FILM	1K	1%	1/6W
R208	RN14BK2C1001F	RES. METAL FILM	1K	1%	1/6W
R209	RN14BK2C2700F	RES. METAL FILM	270	1%	1/6W
R210	RD14BB2C203J	RES. CARBON	20K	5%	1/6W
R211	RD14BB2C361J	RES. CARBON	360	5%	1/6W
R212	RN14BK2C2200F	RES. METAL FILM	220	1%	1/6W
R213	RN14BK2C2200F	RES. METAL FILM	220	1%	1/6W
R214	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R215	RD14BB2C560J	RES. CARBON	56	5%	1/6W
R216	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W
R217	RD14BB2C391J	RES. CARBON	390	5%	1/6W
R218	NO USE				
R219	RN14BK2C1603F	RES. METAL FILM	160K	1%	1/6W
R220	RN14BK2C5601F	RES. METAL FILM	5.6K	1%	1/6W
R221	NO USE				
R222	RN14BK2C2401F	RES. METAL FILM	2.4K	1%	1/6W
R223	RN14BK2C2401F	RES. METAL FILM	2.4K	1%	1/6W
R226	RN14BK2C2001F	RES. METAL FILM	2K	1%	1/6W
R227	RN14BK2C2001F	RES. METAL FILM	2K	1%	1/6W
R228	RN14BK2C2401F	RES. METAL FILM	2.4K	1%	1/6W
R229	RN14BK2C2401F	RES. METAL FILM	2.4K	1%	1/6W
R230	RD14BB2C221J	RES. CARBON	220	5%	1/6W
R231	RD14BB2C221J	RES. CARBON	220	5%	1/6W
R232	RD14BB2C112J	RES. CARBON	1.1K	5%	1/6W
R233	NO USE				
R234	RD14BB2C201J	RES. CARBON	200	5%	1/6W
R235	RD14BB2C821J	RES. CARBON	820	5%	1/6W
R236	RN14BK2C4701F	RES. METAL FILM	4.7K	1%	1/6W
R237	RN14BK2C2201F	RES. METAL FILM	2.2K	1%	1/6W
R238	RN14BK2C2700F	RES. METAL FILM	270	1%	1/6W
R239	RD14BB2C112J	RES. CARBON	1.1K	5%	1/6W
R240	RD14BB2C112J	RES. CARBON	1.1K	5%	1/6W
R241	RD14BB2C151J	RES. CARBON	150	5%	1/6W
R242	RD14BB2C333J	RES. CARBON	33K	5%	1/6W
R243	RN14BK2C3300F	RES. METAL FILM	330	1%	1/6W
R244	RN14BK2C3300F	RES. METAL FILM	330	1%	1/6W
R245	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R246	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R247	RN14BK2C5101F	RES. METAL FILM	5.1K	1%	1/6W
R248	RN14BK2C6801F	RES. METAL FILM	6.8K	1%	1/6W
R249	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R250	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R251	RN14BK2C5101F	RES. METAL FILM	5.1K	1%	1/6W
R252	RN14BK2C6801F	RES. METAL FILM	6.8K	1%	1/6W
R253	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R254	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R255	RD14BB2C561J	RES. CARBON	560	5%	1/6W
R256	RD14BB2C392J	RES. CARBON	3.9K	5%	1/6W
R257	RD14BB2C392J	RES. CARBON	3.9K	5%	1/6W
R258	RD14BB2C122J	RES. CARBON	1.2K	5%	1/6W

* * * P A R T S L I S T * * *

X73-1930-00

REF. NO	PARTS NO	NAME & DESCRIPTION			
R259	RD14BB2C471J	RES. CARBON	470	5%	1/6W
R260	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R261	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R262	RN14BK2C6800F	RES. METAL FILM	680	1%	1/6W
R263	RN14BK2C6800F	RES. METAL FILM	680	1%	1/6W
R264	RN14BK2C1001F	RES. METAL FILM	1K	1%	1/6W
R265	RN14BK2C1001F	RES. METAL FILM	1K	1%	1/6W
R266	RD14BB2C222J	RES. CARBON	2.2K	5%	1/6W
R267	RD14BB2C222J	RES. CARBON	2.2K	5%	1/6W
R268	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R269	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R270	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R271	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R272	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R273	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R274	RD14BB2C751J	RES. CARBON	750	5%	1/6W
R275	RD14BB2C331J	RES. CARBON	330	5%	1/6W
R276	RD14BB2C331J	RES. CARBON	330	5%	1/6W
R277	RD14BB2C272J	RES. CARBON	2.7K	5%	1/6W
R278	RD14BB2C682J	RES. CARBON	6.8K	5%	1/6W
R279	RD14BB2C184J	RES. CARBON	180K	5%	1/6W
R280	RD14BB2C431J	RES. CARBON	430	5%	1/6W
R281	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R282	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R283	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R284	RD14BB2C183J	RES. CARBON	18K	5%	1/6W
R285	RD14BB2C562J	RES. CARBON	5.6K	5%	1/6W
R286	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R287	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R288	RD14BB2C752J	RES. CARBON	7.5K	5%	1/6W
R289	RD14BB2C272J	RES. CARBON	2.7K	5%	1/6W
R290	RN14BK2C1201F	RES. METAL FILM	1.2K	1%	1/6W
R291	RN14BK2C1201F	RES. METAL FILM	1.2K	1%	1/6W
R292	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R293	RD14BB2C182J	RES. CARBON	1.8K	5%	1/6W
R308	RD14BB2C512J	RES. CARBON	5.1K	5%	1/6W
R321	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R322	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R323	RD14BB2C202J	RES. CARBON	2K	5%	1/6W
R324	RD14BB2C202J	RES. CARBON	2K	5%	1/6W
R325	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R326	RD14BB2C302J	RES. CARBON	3K	5%	1/6W
R327	RD14BB2C181J	RES. CARBON	180	5%	1/6W
R328	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W
R329	RD14BB2C333J	RES. CARBON	33K	5%	1/6W
R330	NO USE				
R331	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R332	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R333	RD14BB2C151J	RES. CARBON	150	5%	1/6W
R338	RN14BK2C1501F	RES. METAL FILM	1.5K	1%	1/6W
R339	RN14BK2C1301F	RES. METAL FILM	1.3K	1%	1/6W
R340	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R341	RD14BB2C431J	RES. CARBON	430	5%	1/6W
R342	RD14BB2C750J	RES. CARBON	75	5%	1/6W
R343	NO USE				
R344	RD14BB2C152J	RES. CARBON	1.5K	5%	1/6W

* * * P A R T S L I S T * * *

X73-1930-00

REF. NO	PARTS NO	NAME & DESCRIPTION				
R345	RN14BK2C1301F	RES. METAL FILM	1.3K	1%	1/6W	
R346	RN14BK2C1201F	RES. METAL FILM	1.2K	1%	1/6W	
R351	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W	
R352	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W	
R353	RD14BB2C621J	RES. CARBON	620	5%	1/6W	
R354	RD14BB2C821J	RES. CARBON	820	5%	1/6W	
R355	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W	
R356	RD14BB2C432J	RES. CARBON	4.3K	5%	1/6W	
R357	RD14BB2C331J	RES. CARBON	330	5%	1/6W	
R358	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
R359	RN14BK2C2002F	RES. METAL FILM	20K	1%	1/6W	
R360	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
R361	RN14BK2C9101F	RES. METAL FILM	9.1K	1%	1/6W	
R362	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W	
R363	RD14BB2C182J	RES. CARBON	1.8K	5%	1/6W	
R364	RD14BB2C562J	RES. CARBON	5.6K	5%	1/6W	
R365	RD14BB2C471J	RES. CARBON	470	5%	1/6W	
R366	RD14BB2C513J	RES. CARBON	51K	5%	1/6W	
R367	RD14BB2C362J	RES. CARBON	3.6K	5%	1/6W	
R368	RD14BB2C103J	RES. CARBON	10K	5%	1/6W	
R371	RD14BB2C911J	RES. CARBON	910	5%	1/6W	
R372	RD14BB2C911J	RES. CARBON	910	5%	1/6W	
R373	RD14BB2C222J	RES. CARBON	2.2K	5%	1/6W	
R374	RD14BB2C621J	RES. CARBON	620	5%	1/6W	
R375	RD14BB2C391J	RES. CARBON	390	5%	1/6W	
R376	RD14BB2C391J	RES. CARBON	390	5%	1/6W	
R381	RD14BB2C272J	RES. CARBON	2.7K	5%	1/6W	
R382	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W	
R383	RD14BB2C182J	RES. CARBON	1.8K	5%	1/6W	
R384	RD14BB2C242J	RES. CARBON	2.4K	5%	1/6W	
R385	RD14BB2C471J	RES. CARBON	470	5%	1/6W	
R386	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W	
R387	RD14BB2C182J	RES. CARBON	1.8K	5%	1/6W	
R401	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R402	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R403	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R404	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R405	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R406	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R407	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R408	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R409	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R410	RD14BB2C822J	RES. CARBON	8.2K	5%	1/6W	
R411	RD14BB2C272J	RES. CARBON	2.7K	5%	1/6W	
R412	RD14BB2C470J	RES. CARBON	47	5%	1/6W	
R413	RD14BB2C470J	RES. CARBON	47	5%	1/6W	
R421	RD14BB2C220J	RES. CARBON	22	5%	1/6W	
R422	RD14BB2C105J	RES. CARBON	1M	5%	1/6W	
R423	RD14BB2C684J	RES. CARBON	680K	5%	1/6W	
R424	RD14BB2C751J	RES. CARBON	750	5%	1/6W	
R425	RD14BB2C272J	RES. CARBON	2.7K	5%	1/6W	
R426	RD14BB2C391J	RES. CARBON	390	5%	1/6W	
R427	RD14BB2C131J	RES. CARBON	130	5%	1/6W	
R428	RD14BB2C202J	RES. CARBON	2K	5%	1/6W	

* * * P A R T S L I S T * * *

X73-1930-00

REF. NO	PARTS NO	NAME & DESCRIPTION			
R431	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R432	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R501	RN14BK2C91R0F	RES. METAL FILM	91.0	1%	1/6W
R502	RN14BK2C91R0F	RES. METAL FILM	91.0	1%	1/6W
R503	RN14BK2C4700F	RES. METAL FILM	470	1%	1/6W
R504	RN14BK2C4700F	RES. METAL FILM	470	1%	1/6W
R505	RD14BB2C822J	RES. CARBON	8.2K	5%	1/6W
R506	RN14BK2C3601F	RES. METAL FILM	3.6K	1%	1/6W
R507	RN14BK2C3901F	RES. METAL FILM	3.9K	1%	1/6W
R508	RN14BK2C91R0F	RES. METAL FILM	91.0	1%	1/6W
R509	RN14BK2C91R0F	RES. METAL FILM	91.0	1%	1/6W
R510	RN14BK2C4700F	RES. METAL FILM	470	1%	1/6W
R511	RN14BK2C4700F	RES. METAL FILM	470	1%	1/6W
R512	RD14BB2C822J	RES. CARBON	8.2K	5%	1/6W
R513	RN14BK2C3601F	RES. METAL FILM	3.6K	1%	1/6W
R514	RN14BK2C3901F	RES. METAL FILM	3.9K	1%	1/6W
R520	RD14BB2C181J	RES. CARBON	180	5%	1/6W
R601	RD14BB2C201J	RES. CARBON	200	5%	1/6W
R602	RD14BB2C201J	RES. CARBON	200	5%	1/6W
R607	RD14BB2C242J	RES. CARBON	2.4K	5%	1/6W
R608	RD14BB2C132J	RES. CARBON	1.3K	5%	1/6W
R621	RD14BB2C201J	RES. CARBON	200	5%	1/6W
R622	RD14BB2C201J	RES. CARBON	200	5%	1/6W
R630	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R650	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R701	RD14BB2C104J	RES. CARBON	100K	5%	1/6W
R702	RD14BB2C104J	RES. CARBON	100K	5%	1/6W
R703	RD14BB2C105J	RES. CARBON	1M	5%	1/6W
R704	RD14BB2C105J	RES. CARBON	1M	5%	1/6W
TC2	C05-0446-05	CAP. TRIMMER	30P		
TC3	C05-0444-05	CAP. TRIMMER	10P		
TC97	C05-0448-05	CAP. TRIMMER	70P		
TC202	C05-0446-05	CAP. TRIMMER	30P		
TC203	C05-0444-05	CAP. TRIMMER	10P		
TC280	C05-0443-05	CAP. TRIMMER	6P		
TH1	SDT-20	THERMISTOR			
TH201	SDT-20	THERMISTOR			
TH301	SDT-1000	THERMISTOR			
U102	NJM4558D	IC, DUAL OP AMP			
U202	NJM4558D	IC, DUAL OP AMP			

* * * P A R T S L I S T * * *

X73-1930-00

REF. NO	PARTS NO	NAME & DESCRIPTION
U301	HD74HC04FP	IC, HEX INVERTER
U431	HD74HC595FP	IC, 8-BIT SHIFT REGISTER/LATCH
VR1	R12-4516-05	RES. SEMI FIXED 50KB
VR2	R12-0575-05	RES. SEMI FIXED 100 B
VR3	R12-0575-05	RES. SEMI FIXED 100 B
VR4	R12-0575-05	RES. SEMI FIXED 100 B
VR5	R12-0576-05	RES. SEMI FIXED 200 B
VR97	R12-0576-05	RES. SEMI FIXED 200 B
VR123	R12-1545-05	RES. SEMI FIXED 1KB
VR142	R12-0577-05	RES. SEMI FIXED 500 B
VR201	R12-4516-05	RES. SEMI FIXED 50KB
VR202	R12-0575-05	RES. SEMI FIXED 100 B
VR203	R12-0575-05	RES. SEMI FIXED 100 B
VR204	NO USE	
VR205	R12-0575-05	RES. SEMI FIXED 100 B
VR206	R12-2522-05	RES. SEMI FIXED 5KB
VR215	R12-0576-05	RES. SEMI FIXED 200 B
VR216	R12-0576-05	RES. SEMI FIXED 200 B
VR323	R12-1545-05	RES. SEMI FIXED 1KB
VR324	R12-1546-05	RES. SEMI FIXED 2KB
VR342	R12-0577-05	RES. SEMI FIXED 500 B
VR428	R12-1546-05	RES. SEMI FIXED 2KB

HORIZONTAL UNIT

(X74-1550-00)

* * * P A R T S L I S T * * *

REF. NO	PARTS NO	NAME & DESCRIPTION				
	F10-1651-04	SHIELD PLATE				
	F29-0522-04	INSULATION SHEET				
	J73-0117-02	PCB (UNMOUNTED)				
C1	CC45FCH1H101J	CAP. CERAMIC	100P	5%	50V	
C2	CF92FV1H333J	CAP. POLYESTER	0.033	5%	50V	
C3	CE04EW1C330M	CAP. ELECTRO	33	20%	16V	
C6	CE04EW1C330M	CAP. ELECTRO	33	20%	16V	
C7	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C8	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C12	CE04HW1H010M	CAP. ELECTRO	1	20%	50V	
C13	CE04EW1C330M	CAP. ELECTRO	33	20%	16V	
C14	CC45FCH1H101J	CAP. CERAMIC	100P	5%	50V	
C19	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C27	CC45FSL1H331J	CAP. CERAMIC	330P	5%	50V	
C28	NO USE					
C29	CE04EW1C330M	CAP. ELECTRO	33	20%	16V	
C33	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C39	CC45FCH1H100D	CAP. CERAMIC	10P	0.5P	50V	
C40	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C41	CC45FCH1H221J	CAP. CERAMIC	220P	5%	50V	
C42	NO USE					
C43	CE04EW1C330M	CAP. ELECTRO	33	20%	16V	
C51	CE04BW1E220M	CAP. ELECTRO	22	20%	25V	
C54	CE04EW1C330M	CAP. ELECTRO	33	20%	16V	
C59	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C60	NO USE					
C61	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C62	CQ92FM1H102K	CAP. MYLAR	1000P	10%	50V	
C63	CE04HW1H010M	CAP. ELECTRO	1	20%	50V	
C64	CQ92FM1H222K	CAP. MYLAR	2200P	10%	50V	
C69	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C70	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C71	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C72	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C73	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C74	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C101	CK45FB1H222K	CAP. CERAMIC	2200P	10%	50V	
C102	CK45FB1H102K	CAP. CERAMIC	1000P	10%	50V	
C103	CE04EW1H010M	CAP. ELECTRO	1	20%	50V	
C119	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C120	NO USE					
C121	CE04HW1H010M	CAP. ELECTRO	1	20%	50V	
C122	CE04HW1H010M	CAP. ELECTRO	1	20%	50V	
C123	CE04HW1H010M	CAP. ELECTRO	1	20%	50V	
C124	C91-1246-05	CAP. PLASTIC	4.7	5%	100V	
C125	CQ93AP2A392J	CAP. MYLAR	3900P	5%	100V	
C126	C91-1247-05	CAP. PLASTIC	0.047	2%	100V	

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X74-1550-00

REF. NO	PARTS NO	NAME & DESCRIPTION				
C127	CM93BD2A391J	CAP. MICA	390P	5%	100V	
C131	CE04EW1C470M	CAP. ELECTRO	47	20%	16V	
C132	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C133	CK45FB1H102K	CAP. CERAMIC	1000P	10%	50V	
C134	NO USE					
C135	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C136	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C137	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C138	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C139	CE04EW1C470M	CAP. ELECTRO	47	20%	16V	
C140	CE04EW1C470M	CAP. ELECTRO	47	20%	16V	
C141	CE04EW1C330M	CAP. ELECTRO	33	20%	16V	
C142	CE04EW1C330M	CAP. ELECTRO	33	20%	16V	
C143	CC45CH1H270J	CAP. CERAMIC	27P	5%	50V	
C144	NO USE					
C145	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C148	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C151	CK45B1H102K	CAP. CERAMIC	1000P	10%	50V	
C152	CC45CH1H101J	CAP. CERAMIC	100P	5%	50V	
C153	CE04EW1C330M	CAP. ELECTRO	33	20%	16V	
C154	CQ92M1H104K	CAP. MYLAR	0.1	10%	50V	
C163	CC45CH1H151J	CAP. CERAMIC	150P	5%	50V	
C171	CE04EW1C470M	CAP. ELECTRO	47	20%	16V	
C176	CC45CH1H270J	CAP. CERAMIC	27P	5%	50V	
C177	NO USE					
C178	CE04EW1C100M	CAP. ELECTRO	10	20%	16V	
C179	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C180	CQ92FM1H152K	CAP. MYLAR	1500P	10%	50V	
C181	CC45FCH1H221J	CAP. CERAMIC	220P	5%	50V	
C188	CC45FCH1H221J	CAP. CERAMIC	220P	5%	50V	
C196	CC45FCH1H680J	CAP. CERAMIC	68P	5%	50V	
C204	CC45FCH1H070D	CAP. CERAMIC	7P	0.5P	50V	
C219	CC45FCH1H070D	CAP. CERAMIC	7P	0.5P	50V	
C220	NO USE					
C221	CC45FCH1H220J	CAP. CERAMIC	22P	5%	50V	
C230	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C249	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C250	NO USE					
C251	CE04EW1C330M	CAP. ELECTRO	33	20%	16V	
C254	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C255	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C256	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C257	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C258	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C259	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C260	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	

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X74-1550-00

REF. NO	PARTS NO	NAME & DESCRIPTION			
C261	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C262	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C263	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C264	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C265	NO USE				
C266	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C267	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C268	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C290	CE04EW1C221M	CAP. ELECTRO	220	20%	16V
C291	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C301	CE04EW1C221M	CAP. ELECTRO	220	20%	16V
C302	CE04EW1C221M	CAP. ELECTRO	220	20%	16V
C303	CC45CH1H270J	CAP. CERAMIC	27P	5%	50V
C313	CQ92M1H102K	CAP. MYLAR	1000P	10%	50V
C317	CC45SL1H121J	CAP. CERAMIC	120P	5%	50V
C328	CC45SL1H101J	CAP. CERAMIC	100P	5%	50V
C401	CC45FCH1H221J	CAP. CERAMIC	220P	5%	50V
C402	CQ92M1H102K	CAP. MYLAR	1000P	10%	50V
D1	1SS132	DIODE			
D2	1SS132	DIODE			
D3	1SS132	DIODE			
D4	1SS132	DIODE			
D5	1SS132	DIODE			
D6	1SS132	DIODE			
D7	1SS132	DIODE			
D8	1SS132	DIODE			
D9	1SS132	DIODE			
D10	1SS132	DIODE			
D11	NO USE				
D12	MA700	DIODE			
D13	MA700	DIODE			
D14	MTZ4.7JC	DIODE, ZENER	9.6V		
D21	1SS132	DIODE			
D101	MA700	DIODE			
D102	MA700	DIODE			
D109	MA700	DIODE			
D110	MA700	DIODE			
D111	MA700	DIODE			
D112	MA700	DIODE			
D119	1SS132	DIODE			
D142	MA700	DIODE			
D151	1SS132	DIODE			
D152	1SS132	DIODE			
D162	1SS132	DIODE			

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X74-1550-00

REF. NO	PARTS NO	NAME & DESCRIPTION
D170	MA700	DIODE
D175	1SS132	DIODE
D178	1SS132	DIODE
D179	1SS132	DIODE
D180	1SS132	DIODE
D187	1SS132	DIODE
D221	MA700	DIODE
D236	1SS132	DIODE
D237	1SS132	DIODE
D301	MA700	DIODE
D301	MA700	DIODE
D901	1SS132	DIODE
JW402	E38-0451-15	WIRE ASS'Y
JW403	E38-0452-15	WIRE ASS'Y
JW404	E38-0474-15	WIRE ASS'Y
K1	S51-1527-05	RELAY
P246	E40-3238-05	PIN CONNECTOR 3P
P401	E40-7216-05	PIN CONNECTOR 40P
P402	E40-3243-05	PIN CONNECTOR 8P
P403	NO USE	
P404	E40-3243-05	PIN CONNECTOR 8P
P405	E40-3238-05	PIN CONNECTOR 3P
P406	E40-3238-05	PIN CONNECTOR 3P
Q1	2SA1206(K)	TR. SI, PNP
Q2	2SA1005(K)	TR. SI, PNP
Q3	2SC2671(H)	TR. SI, NPN
Q4	2SK241(Y)	FET, N-CHANNEL
Q5	2SK241(Y)	FET, N-CHANNEL
Q6	2SC2671(H)	TR. SI, NPN
Q7	2SC2671(H)	TR. SI, NPN
Q8	2SA1005(K)	TR. SI, PNP
Q9	2SA1005(K)	TR. SI, PNP
Q10	2SC2785(F)	TR. SI, NPN
Q11	2SA1175(F)	TR. SI, PNP
Q21	2SC4049	TR. SI, NPN
Q51	2SC2785(F)	TR. SI, NPN
Q52	2SC2785(F)	TR. SI, NPN
Q53	2SC2785(F)	TR. SI, NPN
Q54	2SC2785(F)	TR. SI, NPN
Q55	2SC2785(F)	TR. SI, NPN
Q56	2SC2785(F)	TR. SI, NPN
Q101	2SC2785(F)	TR. SI, NPN
Q102	2SA1206(K)	TR. SI, PNP

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X74-1550-00

REF. NO PARTS NO NAME & DESCRIPTION

Q114	2SA1005(K)	TR. SI, PNP			
Q120	2SC3732(L)	TR. SI, NPN			
Q121	2SC2786(K)	TR. SI, NPN			
Q122	2SC2786(K)	TR. SI, NPN			
Q123	2SC2786(K)	TR. SI, NPN			
Q131	2SA1005(K)	TR. SI, PNP			
Q132	2SC2785(F)	TR. SI, NPN			
Q141	2SC3354(S)	TR. SI, NPN			
Q142	2SC3354(S)	TR. SI, NPN			
Q143	2SA1175(F)	TR. SI, PNP			
Q144	2SA1175(F)	TR. SI, PNP			
Q145	2SA1175(F)	TR. SI, PNP			
Q146	2SA1175(F)	TR. SI, PNP			
Q147	2SC2785(F)	TR. SI, NPN			
Q148	2SC2785(F)	TR. SI, NPN			
Q149	2SA1175(F)	TR. SI, PNP			
Q150	2SA1175(F)	TR. SI, PNP			
Q151	2SC3354(S)	TR. SI, NPN			
Q171	2SC2786(K)	TR. SI, NPN			
Q172	2SC2786(K)	TR. SI, NPN			
Q178	2SC2785(F)	TR. SI, NPN			
Q179	2SC2785(F)	TR. SI, NPN			
Q180	2SC2785(F)	TR. SI, NPN			
Q183	2SA1175(F)	TR. SI, PNP			
Q184	2SA1175(F)	TR. SI, PNP			
Q185	NO USE				
Q186	2SA1175(F)	TR. SI, PNP			
Q187	2SA1175(F)	TR. SI, PNP			
Q201	2SC2785(F)	TR. SI, NPN			
Q202	2SC2786(K)	TR. SI, NPN			
Q203	2SC2786(K)	TR. SI, NPN			
Q204	2SC2786(K)	TR. SI, NPN			
Q205	2SC2785(F)	TR. SI, NPN			
Q401	2SC2785(F)	TR. SI, NPN			
R1	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R2	RD14BB2C561J	RES. CARBON	560	5%	1/6W
R3	RN14BK2C4301F	RES. METAL FILM	4.3K	1%	1/6W
R4	RN14BK2C5101F	RES. METAL FILM	5.1K	1%	1/6W
R5	RD14BB2C621J	RES. CARBON	620	5%	1/6W
R6	RD14BB2C302J	RES. CARBON	3K	5%	1/6W
R7	RD14BB2C751J	RES. CARBON	750	5%	1/6W
R8	RD14BB2C152J	RES. CARBON	1.5K	5%	1/6W
R9	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R10	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R11	NO USE				
R12	RD14BB2C471J	RES. CARBON	470	5%	1/6W
R13	RD14BB2C202J	RES. CARBON	2K	5%	1/6W
R14	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R15	RD14BB2C153J	RES. CARBON	15K	5%	1/6W

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P A R T S L I S T

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X74-1550-00

REF. NO	PARTS NO	NAME & DESCRIPTION
R16	NO USE	
R17	RN14BK2C1803F	RES. METAL FILM 180K 1% 1/6W
R18	NO USE	
R19	RN14BK2C2002F	RES. METAL FILM 20K 1% 1/6W
R20	RD14BB2C332J	RES. CARBON 3.3K 5% 1/6W
R21	RD14BB2C332J	RES. CARBON 3.3K 5% 1/6W
R22	RD14BB2C220J	RES. CARBON 22 5% 1/6W
R23	RD14BB2C220J	RES. CARBON 22 5% 1/6W
R24	RD14BB2C820J	RES. CARBON 82 5% 1/6W
R25	RD14BB2C820J	RES. CARBON 82 5% 1/6W
R26	RN14BK2C82R0F	RES. METAL FILM 82.0 1% 1/6W
R27	RD14BB2C510J	RES. CARBON 51 5% 1/6W
R28	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R29	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R30	NO USE	
R31	RN14BK2C2400F	RES. METAL FILM 240 1% 1/6W
R32	RN14BK2C2400F	RES. METAL FILM 240 1% 1/6W
R33	RD14BB2C470J	RES. CARBON 47 5% 1/6W
R34	RD14BB2C470J	RES. CARBON 47 5% 1/6W
R35	RN14BK2C2701F	RES. METAL FILM 2.7K 1% 1/6W
R36	RN14BK2C5601F	RES. METAL FILM 5.6K 1% 1/6W
R37	RN14BK2C8200F	RES. METAL FILM 820 1% 1/6W
R38	RN14BK2C8200F	RES. METAL FILM 820 1% 1/6W
R39	RD14BB2C911J	RES. CARBON 910 5% 1/6W
R40	RD14BB2C511J	RES. CARBON 510 5% 1/6W
R41	RN14BK2C1602F	RES. METAL FILM 16K 1% 1/6W
R42	RN14BK2C5601F	RES. METAL FILM 5.6K 1% 1/6W
R43	RN14BK2C3900F	RES. METAL FILM 390 1% 1/6W
R44	RN14BK2C4701F	RES. METAL FILM 4.7K 1% 1/6W
R45	RN14BK2C4701F	RES. METAL FILM 4.7K 1% 1/6W
R51	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R52	RD14BB2C473J	RES. CARBON 47K 5% 1/6W
R53	RD14BB2C273J	RES. CARBON 27K 5% 1/6W
R54	RD14BB2C202J	RES. CARBON 2K 5% 1/6W
R55	RD14BB2C222J	RES. CARBON 2.2K 5% 1/6W
R56	RD14BB2C473J	RES. CARBON 47K 5% 1/6W
R57	RD14BB2C202J	RES. CARBON 2K 5% 1/6W
R58	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R59	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R60	RD14BB2C754J	RES. CARBON 750K 5% 1/6W
R61	RD14BB2C244J	RES. CARBON 240K 5% 1/6W
R62	RD14BB2C622J	RES. CARBON 6.2K 5% 1/6W
R63	RD14BB2C332J	RES. CARBON 3.3K 5% 1/6W
R64	RD14BB2C153J	RES. CARBON 15K 5% 1/6W
R65	RD14BB2C242J	RES. CARBON 2.4K 5% 1/6W
R66	RD14BB2C132J	RES. CARBON 1.3K 5% 1/6W
R67	RD14BB2C161J	RES. CARBON 160 5% 1/6W
R68	RD14BB2C183J	RES. CARBON 18K 5% 1/6W
R69	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R70	RD14BB2C821J	RES. CARBON 820 5% 1/6W
R71	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R72	RD14BB2C272J	RES. CARBON 2.7K 5% 1/6W
R73	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R74	RD14BB2C511J	RES. CARBON 510 5% 1/6W
R75	RD14BB2C242J	RES. CARBON 2.4K 5% 1/6W
R76	RD14BB2C471J	RES. CARBON 470 5% 1/6W
R77	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R78	RD14BB2C222J	RES. CARBON 2.2K 5% 1/6W

* * * P A R T S L I S T * * *

X74-1550-00

REF. NO	PARTS NO	NAME & DESCRIPTION				
R79	NO USE					
R80	RD14BB2C220J	RES. CARBON	22	5%	1/6W	
R81	RD14BB2C181J	RES. CARBON	180	5%	1/6W	
R84	RD14BB2C224J	RES. CARBON	220K	5%	1/6W	
R85	RD14BB2C224J	RES. CARBON	220K	5%	1/6W	
R86	RD14BB2C103J	RES. CARBON	10K	5%	1/6W	
R87	RN14BK2C1802F	RES. METAL FILM	18K	1%	1/6W	
R88	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W	
R89	RD14BB2C471J	RES. CARBON	470	5%	1/6W	
R90	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W	
R101	RD14BB2C511J	RES. CARBON	510	5%	1/6W	
R102	RD14BB2C470J	RES. CARBON	47	5%	1/6W	
R105	RD14BB2C103J	RES. CARBON	10K	5%	1/6W	
R106	RD14BB2C134J	RES. CARBON	130K	5%	1/6W	
R107	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
R108	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
R109	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
R110	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
R111	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
R112	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
R113	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
R114	RD14BB2C471J	RES. CARBON	470	5%	1/6W	
R115	RN14BK2C2001F	RES. METAL FILM	2K	1%	1/6W	
R116	RN14BK2C3001F	RES. METAL FILM	3K	1%	1/6W	
R117	RD14BB2C911J	RES. CARBON	910	5%	1/6W	
R118	NO USE					
R119	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
R120	RD14BB2C274J	RES. CARBON	270K	5%	1/6W	
R121	RD14BB2C242J	RES. CARBON	2.4K	5%	1/6W	
R122	RD14BB2C242J	RES. CARBON	2.4K	5%	1/6W	
R123	RD14BB2C103J	RES. CARBON	10K	5%	1/6W	
R127	RD14BB2C151J	RES. CARBON	150	5%	1/6W	
R131	RN14BK2C2402F	RES. METAL FILM	24K	1%	1/6W	
R132	RN14BK2C2703F	RES. METAL FILM	270K	1%	1/6W	
R133	RN14BK2C1503F	RES. METAL FILM	150K	1%	1/6W	
R134	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
R135	NO USE					
R136	RD14BB2C103J	RES. CARBON	10K	5%	1/6W	
R137	NO USE					
R138	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R141	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W	
R142	NO USE					
R143	RD14BB2C511J	RES. CARBON	510	5%	1/6W	
R144	RN14BK2C5601F	RES. METAL FILM	5.6K	1%	1/6W	
R145	RD14BB2C272J	RES. CARBON	2.7K	5%	1/6W	
R146	RD14BB2C182J	RES. CARBON	1.8K	5%	1/6W	
R147	RD14BB2C152J	RES. CARBON	1.5K	5%	1/6W	
R148	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W	
R149	RD14BB2C470J	RES. CARBON	47	5%	1/6W	
R150	NO USE					
R151	RN14BK2C3901F	RES. METAL FILM	3.9K	1%	1/6W	
R152	RN14BK2C5101F	RES. METAL FILM	5.1K	1%	1/6W	
R153	RD14BB2C273J	RES. CARBON	27K	5%	1/6W	

* * * P A R T S L I S T * * *

X74-1550-00

REF. NO	PARTS NO	NAME & DESCRIPTION				
R154	RD14BB2C273J	RES. CARBON	27K	5%	1/6W	
R155	RD14BB2C822J	RES. CARBON	8.2K	5%	1/6W	
R156	RD14BB2C273J	RES. CARBON	27K	5%	1/6W	
R157	RD14BB2C273J	RES. CARBON	27K	5%	1/6W	
R158	RD14BB2C822J	RES. CARBON	8.2K	5%	1/6W	
R159	RD14BB2C113J	RES. CARBON	11K	5%	1/6W	
R160	NO USE					
R161	RN14BK2C5600F	RES. METAL FILM	560	1%	1/6W	
R162	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W	
R163	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
R164	RD14BB2C273J	RES. CARBON	27K	5%	1/6W	
R165	RD14BB2C273J	RES. CARBON	27K	5%	1/6W	
R166	RD14BB2C822J	RES. CARBON	8.2K	5%	1/6W	
R170	RN14BK2C2002F	RES. METAL FILM	20K	1%	1/6W	
R171	RN14BK2C2701F	RES. METAL FILM	2.7K	1%	1/6W	
R172	RD14BB2C470J	RES. CARBON	47	5%	1/6W	
R173	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W	
R174	RN14BK2C4701F	RES. METAL FILM	4.7K	1%	1/6W	
R175	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R176	RN14BK2C2402F	RES. METAL FILM	24K	1%	1/6W	
R177	NO USE					
R178	RD14BB2C103J	RES. CARBON	10K	5%	1/6W	
R179	RD14BB2C103J	RES. CARBON	10K	5%	1/6W	
R180	RD14BB2C103J	RES. CARBON	10K	5%	1/6W	
R181	RD14BB2C622J	RES. CARBON	6.2K	5%	1/6W	
R182	NO USE					
R183	RD14BB2C221J	RES. CARBON	220	5%	1/6W	
R184	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W	
R185	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
R186	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R187	RD14BB2C272J	RES. CARBON	2.7K	5%	1/6W	
R188	RD14BB2C562J	RES. CARBON	5.6K	5%	1/6W	
R189	NO USE					
R190	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W	
R191	NO USE					
R192	RD14BB2C221J	RES. CARBON	220	5%	1/6W	
R193	RD14BB2C221J	RES. CARBON	220	5%	1/6W	
R196	RD14BB2C221J	RES. CARBON	220	5%	1/6W	
R201	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
R202	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R203	RD14BB2C392J	RES. CARBON	3.9K	5%	1/6W	
R204	RD14BB2C681J	RES. CARBON	680	5%	1/6W	
R205	RD14BB2C242J	RES. CARBON	2.4K	5%	1/6W	
R206	RD14BB2C272J	RES. CARBON	2.7K	5%	1/6W	
R207	RD14BB2C470J	RES. CARBON	47	5%	1/6W	
R208	RD14BB2C561J	RES. CARBON	560	5%	1/6W	
R209	RD14BB2C162J	RES. CARBON	1.6K	5%	1/6W	
R210	RD14BB2C432J	RES. CARBON	4.3K	5%	1/6W	
R211	RD14BB2C470J	RES. CARBON	47	5%	1/6W	
R212	RD14BB2C470J	RES. CARBON	47	5%	1/6W	
R213	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R214	RD14BB2C471J	RES. CARBON	470	5%	1/6W	
R215	RD14BB2C622J	RES. CARBON	6.2K	5%	1/6W	
R216	RD14BB2C470J	RES. CARBON	47	5%	1/6W	
R217	RD14BB2C302J	RES. CARBON	3K	5%	1/6W	
R218	RD14BB2C242J	RES. CARBON	2.4K	5%	1/6W	

* * * P A R T S L I S T * * *

X74-1550-00

REF. NO	PARTS NO	NAME & DESCRIPTION			
R219	RD14BB2C681J	RES. CARBON	680	5%	1/6W
R220	RD14BB2C392J	RES. CARBON	3.9K	5%	1/6W
R221	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R225	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R226	RD14BB2C820J	RES. CARBON	82	5%	1/6W
R227	RD14BB2C391J	RES. CARBON	390	5%	1/6W
R228	RD14BB2C471J	RES. CARBON	470	5%	1/6W
R229	RD14BB2C152J	RES. CARBON	1.5K	5%	1/6W
R230	RD14BB2C392J	RES. CARBON	3.9K	5%	1/6W
R231	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R232	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R233	RD14BB2C683J	RES. CARBON	68K	5%	1/6W
R234	RD14BB2C303J	RES. CARBON	30K	5%	1/6W
R235	RD14BB2C474J	RES. CARBON	470K	5%	1/6W
R236	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R237	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R238	RN14BK2C7502F	RES. METAL FILM	75K	1%	1/6W
R239	RN14BK2C5601F	RES. METAL FILM	5.6K	1%	1/6W
R240	RN14BK2C4702F	RES. METAL FILM	47K	1%	1/6W
R246	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R247	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R248	RD14BB2C220J	RES. CARBON	22	5%	1/6W
R249	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W
R250	NO USE				
R251	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R252	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R253	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R301	R90-0647-05	RES. NETWORK(SWEEP 1)			
R302	R90-0651-05	RES. NETWORK(SWEEP 2)			
R310	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R311	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R312	NO USE				
R313	RD14BB2C242J	RES. CARBON	2.4K	5%	1/6W
R343	RD14BB2C152J	RES. CARBON	1.5K	5%	1/6W
R401	RD14BB2C432J	RES. CARBON	4.3K	5%	1/6W
TC127	C05-0449-05	CAP. TRIMMER	100P		
TC128	C05-0445-05	CAP. TRIMMER	20P		
U101	HD74HC00FP	IC, QUAD 2 INPUT NAND GATE			
U102	MC10102L	IC, QUAD 2-INPUT NOR GATE			
U103	MC10H131L	IC, DUAL D-FILP FLOP			
U104	HD74HC123AFP	IC, DUAL RETRIGG. SINGLE SHOT			
U105	HD74HC08FP	IC, QUAD 2-INPUT AND GATE			
U106	HD74HC00FP	IC, QUAD 2 INPUT NAND GATE			
U107	SN74ALS00N	IC, QUAD 2-INPUT NAND GATE			
U108	HD74HC00FP	IC, QUAD 2 INPUT NAND GATE			
U109	HD74HC112FP	IC, DUAL J-K F.F. (WITH PR&CLR)			
U110	HD74HC595FP	IC, 8-BIT SHIFT REGISTER/LATCH			
U111	HD74HC595FP	IC, 8-BIT SHIFT REGISTER/LATCH			
U112	MC10107L	IC, TRIPLE 2 INPUT EXC OR/NOR			
U113	HD74HC595F	IC, 8-BIT SHIFT REGISTER/LATCH			
U114	HD14053BFP	IC, TRIPLE 2CH ANALOG MPX/DE-MP			

X74-1550-00

* * * P A R T S L I S T * * *

REF. NO	PARTS NO	NAME & DESCRIPTION
U121	HD14051BFP	IC, 8-CH ANALOG MPX/DE-MPX
U122	HD14051BFP	IC, 8-CH ANALOG MPX/DE-MPX
U123	HD14051BFP	IC, 8-CH ANALOG MPX/DE-MPX
U124	HD14051BFP	IC, 8-CH ANALOG MPX/DE-MPX
U141	2SK332(F)	FET, N-CHANNEL
U201	NJM072M	IC, DUAL J-FET INPUT OP-AMP
U202	NJM4558M	IC, DUAL OP-AMP
U203	NJM072M	IC, DUAL J-FET INPUT OP-AMP
VR1	R12-3549-05	RES. SEMI FIXED 10KB
VR138	R12-2522-05	RES. SEMI FIXED 5KB
VR143	R12-1545-05	RES. SEMI FIXED 1KB
VR144	NO USE	
VR145	R12-2522-05	RES. SEMI FIXED 5KB

ATT UNIT

(X75-1200-00)

* * * P A R T S L I S T * * *

REF. NO	PARTS NO	NAME & DESCRIPTION				
	J21-4755-04	BRACKET; FOR ATT				
	J73-0115-03	PCB (UNMOUNTED)				
	N09-0739-05	SCREW, SEMS BINDING TAPTITE 3X8				
	N32-3006-41	SCREW, FLAT HD M3X6				
C1	C91-0502-05	CAP. POLYESTER	0.01	20%	630V	
C2	CE04BW1E220M	CAP. ELECTRO	22	20%	25V	
C3	CQ92FM1H102K	CAP. MYLAR	1000P	10%	50V	
C4	CQ92FM1H103K	CAP. MYLAR	0.01	10%	50V	
C5	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C6	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C9	CE04EW1C101M	CAP. ELECTRO	100	20%	16V	
C10	CE04EW1C101M	CAP. ELECTRO	100	20%	16V	
C14	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C15	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C16	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C17	CC45FCH1H470J	CAP. CERAMIC	47P	5%	50V	
C24	CC45FCH1H050C	CAP. CERAMIC	5P	0.25P	50V	
C101	C91-0502-05	CAP. POLYESTER	0.01	20%	630V	
C102	CE04BW1E220M	CAP. ELECTRO	22	20%	25V	
C103	CQ92FM1H102K	CAP. MYLAR	1000P	10%	50V	
C104	CQ92FM1H103K	CAP. MYLAR	0.01	10%	50V	
C105	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C106	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C109	CE04EW1C101M	CAP. ELECTRO	100	20%	16V	
C110	CE04EW1C101M	CAP. ELECTRO	100	20%	16V	
C114	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C115	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C116	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C117	CC45FCH1H470J	CAP. CERAMIC	47P	5%	50V	
C124	CC45FCH1H050C	CAP. CERAMIC	5P	0.25P	50V	
C201	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C202	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C210	CE04EW1C221M	CAP. ELECTRO	220	20%	16V	
C211	CE04EW1C221M	CAP. ELECTRO	220	20%	16V	
C212	CE04EW1C471M	CAP. ELECTRO	470	20%	16V	
C213	CE04EW1C471M	CAP. ELECTRO	470	20%	16V	
C214	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C215	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
D1	1SS132	DIODE				
D2	MTZ5.1JB	DIODE, ZENER	5.07V			
D101	1SS132	DIODE				
D102	MTZ5.1JB	DIODE, ZENER	5.07V			
D201	1SS132	DIODE				
D202	1SS132	DIODE				
D203	1SS132	DIODE				
D204	1SS132	DIODE				

* * * P A R T S L I S T * * *

X75-1200-00

REF. NO	PARTS NO	NAME & DESCRIPTION
K1	S51-2508-05	RELAY
K2	S51-2508-05	RELAY
K101	S51-2508-05	RELAY
K102	S51-2508-05	RELAY
L210	L40-1011-03	FERRI INDUCTOR 100UH 10%
P1	E40-3238-05	PIN CONNECTOR 3P
P101	E40-3238-05	PIN CONNECTOR 3P
P202	E40-3243-05	PIN CONNECTOR 8P
P211	E40-3238-05	PIN CONNECTOR 3P
Q1	2SK404(F)	FET, N-CHANNEL
Q2	2SC3354(S)	TR. SI, NPN
Q3	2SC3354(S)	TR. SI, NPN
Q4	2SC3354(S)	TR. SI, NPN
Q5	2SC3354(S)	TR. SI, NPN
Q101	2SK404(F)	FET, N-CHANNEL
Q102	2SC3354(S)	TR. SI, NPN
Q103	2SC3354(S)	TR. SI, NPN
Q104	2SC3354(S)	TR. SI, NPN
Q105	2SC3354(S)	TR. SI, NPN
Q201	2SC4049	TR. SI, NPN
Q202	2SC4049	TR. SI, NPN
Q203	2SC4049	TR. SI, NPN
Q204	2SC4049	TR. SI, NPN
R1	RD14BB2C100J	RES. CARBON 10 5% 1/6W
R2	RN14BK2E1803D	RES. METAL FILM 180K 0.5% 1/4W
R3	RN14BK2E8203D	RES. METAL FILM 820K 0.5% 1/4W
R4	RD14BB2C684J	RES. CARBON 680K 5% 1/6W
R5	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R6	RD14BB2C132J	RES. CARBON 1.3K 5% 1/6W
R7	RD14BB2C622J	RES. CARBON 6.2K 5% 1/6W
R8	RD14BB2C392J	RES. CARBON 3.9K 5% 1/6W
R9	RD14BB2C100J	RES. CARBON 10 5% 1/6W
R10	RD14BB2C751J	RES. CARBON 750 5% 1/6W
R11	RD14BB2C181J	RES. CARBON 180 5% 1/6W
R12	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R13	RD14BB2C562J	RES. CARBON 5.6K 5% 1/6W
R14	RN14BK2C1004F	RES. METAL FILM 1M 1% 1/6W
R15	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R16	RD14BB2C100J	RES. CARBON 10 5% 1/6W
R17	RD14BB2C621J	RES. CARBON 620 5% 1/6W
R18	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R19	RN14BK2C1500F	RES. METAL FILM 150 1% 1/6W
R20	RN14BK2C3000D	RES. METAL FILM 300 0.5% 1/6W
R21	RN14BK2C3000D	RES. METAL FILM 300 0.5% 1/6W
R22	RN14BK2C6000D	RES. METAL FILM 600 0.5% 1/6W
R23	RN14BK2C2000D	RES. METAL FILM 200 0.5% 1/6W
R24	RD14BB2C621J	RES. CARBON 620 5% 1/6W
R31	RD14BB2C103J	RES. CARBON 10K 5% 1/6W

* * * P A R T S L I S T * * *

X75-1200-00

REF.NO PARTS NO NAME & DESCRIPTION

R101	RD14BB2C100J	RES. CARBON	10	5%	1/6W
R102	RN14BK2E1803D	RES. METAL FILM	180K	0.5%	1/4W
R103	RN14BK2E8203D	RES. METAL FILM	820K	0.5%	1/4W
R104	RD14BB2C684J	RES. CARBON	680K	5%	1/6W
R105	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R106	RD14BB2C132J	RES. CARBON	1.3K	5%	1/6W
R107	RD14BB2C622J	RES. CARBON	6.2K	5%	1/6W
R108	RD14BB2C392J	RES. CARBON	3.9K	5%	1/6W
R109	RD14BB2C100J	RES. CARBON	10	5%	1/6W
R110	RD14BB2C751J	RES. CARBON	750	5%	1/6W
R111	RD14BB2C181J	RES. CARBON	180	5%	1/6W
R112	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R113	RD14BB2C562J	RES. CARBON	5.6K	5%	1/6W
R114	RN14BK2C1004F	RES. METAL FILM	1M	1%	1/6W
R115	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R116	RD14BB2C100J	RES. CARBON	10	5%	1/6W
R117	RD14BB2C621J	RES. CARBON	620	5%	1/6W
R118	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R119	RN14BK2C1500F	RES. METAL FILM	150	1%	1/6W
R120	RN14BK2C3000D	RES. METAL FILM	300	0.5%	1/6W
R121	RN14BK2C3000D	RES. METAL FILM	300	0.5%	1/6W
R122	RN14BK2C6000D	RES. METAL FILM	600	0.5%	1/6W
R123	RN14BK2C2000D	RES. METAL FILM	200	0.5%	1/6W
R124	RD14BB2C621J	RES. CARBON	620	5%	1/6W

R131	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
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R201	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R202	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R203	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R204	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R205	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R206	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R207	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R208	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R209	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R210	RD14BB2C223J	RES. CARBON	22K	5%	1/6W
R211	RD14BB2C223J	RES. CARBON	22K	5%	1/6W

S1	S02-4511-15	ATTENUATOR UNIT
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S101	S02-4511-15	ATTENUATOR UNIT
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U1	LF411CN	IC,DUAL JFET INPUT OP AMP
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U101	LF411CN	IC,DUAL JFET INPUT OP AMP
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U201	HD74HC595FP	IC,8-BIT SHIFT REGISTER/LATCH
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U202	HD74HC595FP	IC,8-BIT SHIFT REGISTER/LATCH
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VR1	R12-4516-05	RES. SEMI FIXED 50KB
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VR2	R12-0577-05	RES. SEMI FIXED 500 B
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VR101	R12-4516-05	RES. SEMI FIXED 50KB
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VR102	R12-0577-05	RES. SEMI FIXED 500 B
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READOUT UNIT

(X77-1720-00)

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PARTS LIST

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REF. NO	PARTS NO	NAME & DESCRIPTION				
	F10-1649-03	SHIELD PLATE				
	F29-0520-04	INSULATION SHEET				
	J73-0118-02	PCB (UNMOUNTED)				
B1	W09-0408-05	BATTERY, CR2354-1HF				
C1	CE04EW1C220M	CAP. ELECTRO	22	20%	16V	
C2	CC45FCH1H220J	CAP. CERAMIC	22P	5%	50V	
C3	CC45FCH1H220J	CAP. CERAMIC	22P	5%	50V	
C24	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C25	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C26	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C27	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C28	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C29	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C30	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C31	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C32	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C33	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C34	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C35	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C36	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C37	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C38	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C39	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C40	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C41	CK45FB1H102K	CAP. CERAMIC	1000P	10%	50V	
C52	CE04EW1H010M	CAP. ELECTRO	1	20%	50V	
C60	CE04EW1C101M	CAP. ELECTRO	100	20%	16V	
C61	CC45FCH1H101J	CAP. CERAMIC	100P	5%	50V	
C62	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C63	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C64	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C65	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C66	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C67	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C68	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C69	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C70	CE04EW1H010M	CAP. ELECTRO	1	20%	50V	
C71	CE04EW1H010M	CAP. ELECTRO	1	20%	50V	
C72	CE04EW1H010M	CAP. ELECTRO	1	20%	50V	
C73	CE04EW1H010M	CAP. ELECTRO	1	20%	50V	
C102	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C103	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C104	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V	
C105	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C106	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C107	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C108	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C109	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C110	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C111	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C112	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C113	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C114	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	
C115	CK45FF1H103Z	CAP. CERAMIC	0.01		50V	

* * * P A R T S L I S T * * *

X77-1720-00

REF. NO	PARTS NO	NAME & DESCRIPTION			
C116	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C117	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C118	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C119	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C120	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C121	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C122	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C123	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C124	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C125	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C126	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C127	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C128	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C129	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C130	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C131	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C132	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C133	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C134	NO USE				
C135	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C136	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C137	NO USE				
C138	CE04EW1C470M	CAP. ELECTRO	47	20%	16V
C139	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C140	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C141	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C142	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C143	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C144	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C145	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C146	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C147	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C148	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C149	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C150	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C151	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C152	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C153	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C161	CE04EW1C101M	CAP. ELECTRO	100	20%	16V
C162	CE04EW1C101M	CAP. ELECTRO	100	20%	16V
C163	CE04EW1C101M	CAP. ELECTRO	100	20%	16V
C164	CE04EW1C101M	CAP. ELECTRO	100	20%	16V
C165	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C166	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C167	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C168	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C169	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C170	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
D1	1SS132	DIODE			
D2	1SS132	DIODE			
D3	1SS132	DIODE			
D4	1SS132	DIODE			
D5	DAP803	DIODE ARRAY			
D6	DAP803	DIODE ARRAY			
D7	1SS132	DIODE			
D8	MTZ5.1JB	DIODE, ZENER	5.07V		

* * * P A R T S L I S T * * *

X77-1720-00

REF. NO	PARTS NO	NAME & DESCRIPTION				
L1	L40-1011-03	FERRI INDUCTOR	100UH	10%		
L2	L40-1011-03	FERRI INDUCTOR	100UH	10%		
P1	E40-7212-05	PIN CONNECTOR	34P			
P2	E40-7211-05	PIN CONNECTOR	20P			
P3	E40-7209-05	PIN CONNECTOR	50P			
P4	E40-7035-05	SOCKET	40P			
Q1	2SC3354(S)	TR. SI, NPN				
Q2	2SC3354(S)	TR. SI, NPN				
R1	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R2	RD14BB2C391J	RES. CARBON	390	5%	1/6W	
R3	RD14BB2C392J	RES. CARBON	3.9K	5%	1/6W	
R4	RD14BB2C391J	RES. CARBON	390	5%	1/6W	
R5	RD14BB2C103J	RES. CARBON	10K	5%	1/6W	
R6	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W	
R7	RD14BB2C103J	RES. CARBON	10K	5%	1/6W	
R8	NO USE					
R9	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W	
R10	RD14BB2C103J	RES. CARBON	10K	5%	1/6W	
R24	RD14BB2C104J	RES. CARBON	100K	5%	1/6W	
R25	RD14BB2C273J	RES. CARBON	27K	5%	1/6W	
R28	RD14BB2C152J	RES. CARBON	1.5K	5%	1/6W	
R29	RD14BB2C152J	RES. CARBON	1.5K	5%	1/6W	
R30	RN14BK2C1303F	RES. METAL FILM	130K	1%	1/6W	
R31	RD14BB2C103J	RES. CARBON	10K	5%	1/6W	
R32	RD14BB2C103J	RES. CARBON	10K	5%	1/6W	
R33	NO USE					
R34	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W	
R35	RN14BK2C5101F	RES. METAL FILM	5.1K	1%	1/6W	
R36	RN14BK2C5101F	RES. METAL FILM	5.1K	1%	1/6W	
R37	RN14BK2C3302F	RES. METAL FILM	33K	1%	1/6W	
R38	RN14BK2C9090F	RES. METAL FILM	909	1%	1/6W	
R39	RN14BK2C1801F	RES. METAL FILM	1.8K	1%	1/6W	
R40	RN14BK2C4701F	RES. METAL FILM	4.7K	1%	1/6W	
R41	RN14BK2C2400F	RES. METAL FILM	240	1%	1/6W	
R42	RN14BK2C1801F	RES. METAL FILM	1.8K	1%	1/6W	
R43	RN14BK2C4701F	RES. METAL FILM	4.7K	1%	1/6W	
R44	RN14BK2C2400F	RES. METAL FILM	240	1%	1/6W	
R45	NO USE					
R46	RN14BK2C1002F	RES. METAL FILM	10K	1%	1/6W	
R47	RN14BK2C1002F	RES. METAL FILM	10K	1%	1/6W	
R48	RN14BK2C5600F	RES. METAL FILM	560	1%	1/6W	
R49	RN14BK2C5600F	RES. METAL FILM	560	1%	1/6W	
R50	RD14BB2C103J	RES. CARBON	10K	5%	1/6W	
R51	RD14BB2C103J	RES. CARBON	10K	5%	1/6W	
R52	NO USE					
R53	RD14BB2C103J	RES. CARBON	10K	5%	1/6W	
R54	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R58	RD14BB2C222J	RES. CARBON	2.2K	5%	1/6W	
R59	RD14BB2C222J	RES. CARBON	2.2K	5%	1/6W	
R60	RD14BB2C222J	RES. CARBON	2.2K	5%	1/6W	
R61	RD14BB2C222J	RES. CARBON	2.2K	5%	1/6W	
R62	RD14BB2C473J	RES. CARBON	47K	5%	1/6W	
R63	RD14BB2C473J	RES. CARBON	47K	5%	1/6W	

* * * P A R T S L I S T * * *

X77-1720-00

REF. NO	PARTS NO	NAME & DESCRIPTION				
R64	RD14BB2C473J	RES. CARBON	47K	5%	1/6W	
R65	RD14BB2C473J	RES. CARBON	47K	5%	1/6W	
R66	RD14BB2C473J	RES. CARBON	47K	5%	1/6W	
R67	RD14BB2C103J	RES. CARBON	10K	5%	1/6W	
R70	RD14BB2C473J	RES. CARBON	47K	5%	1/6W	
R71	RD14BB2C473J	RES. CARBON	47K	5%	1/6W	
R72	RD14BB2C331J	RES. CARBON	330	5%	1/6W	
R73	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R74	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R75	RN14BK2C2001F	RES. METAL FILM	2K	1%	1/6W	
R76	RN14BK2C2001F	RES. METAL FILM	2K	1%	1/6W	
R77	RN14BK2C2001F	RES. METAL FILM	2K	1%	1/6W	
R78	RN14BK2C2001F	RES. METAL FILM	2K	1%	1/6W	
R79	RN14BK2C2001F	RES. METAL FILM	2K	1%	1/6W	
R91	RD14BB2C473J	RES. CARBON	47K	5%	1/6W	
R92	RD14BB2C473J	RES. CARBON	47K	5%	1/6W	
R93	RD14BB2C473J	RES. CARBON	47K	5%	1/6W	
R94	RD14BB2C473J	RES. CARBON	47K	5%	1/6W	
R95	RN14BK2C2001F	RES. METAL FILM	2K	1%	1/6W	
R96	RN14BK2C2001F	RES. METAL FILM	2K	1%	1/6W	
R97	RN14BK2C2001F	RES. METAL FILM	2K	1%	1/6W	
R98	RN14BK2C2001F	RES. METAL FILM	2K	1%	1/6W	
R99	RD14BB2C392J	RES. CARBON	3.9K	5%	1/6W	
R100	NO USE					
R101	RD14BB2C431J	RES. CARBON	430	5%	1/6W	
R102	RD14BB2C431J	RES. CARBON	430	5%	1/6W	
R103	RD14BB2C431J	RES. CARBON	430	5%	1/6W	
R104	RD14BB2C431J	RES. CARBON	430	5%	1/6W	
R105	RD14BB2C431J	RES. CARBON	430	5%	1/6W	
R106	RN14BK2C3602F	RES. METAL FILM	36K	1%	1/6W	
RA1	R90-0662-05	RES. NETWORK				
RA2	R90-0663-05	RES. NETWORK	8X1M			
U1	LH0080BF	IC, Z80B CPU				
U2	T93-0751-04	PROGRAMMED ROM				
U3	MB8464-10LL-FP	IC, S-RAM				
U4	CTM5110	IC, GATE ARRAY				
U5	HD74HC138FP	IC, 3-8 DECOD./DE-MPX				
U6	HD74LS138FP	IC, 3-TO-8 DEMULTIPLEXER				
U7	HD74HC238FP	IC, 3-TO-8 LINE DECODER				
U8	HD74HC138FP	IC, 3-8 DECOD./DE-MPX				
U9	HD74LS244FP	IC, OCTAL 3-STATE BUS BUFFER				
U10	HD74LS244FP	IC, OCTAL 3-STATE BUS BUFFER				
U11	HD74LS244FP	IC, OCTAL 3-STATE BUS BUFFER				
U12	HD74HC574FP	IC, OCTAL D-F.F. (3-S)				
U13	HD74LS244FP	IC, OCTAL 3-STATE BUS BUFFER				
U14	HD74HC244FP	IC, OCTAL BUS BUFFER				
U15	HD74LS107AFP	IC, QUAD JK-FF WITH CLEAR				
U16	HD74LS107AFP	IC, QUAD JK-FF WITH CLEAR				
U17	NO USE					
U18	HD74LS107AFP	IC, QUAD JK-FF WITH CLEAR				
U19	HA17555PS	IC, TIMER				
U23	MSM6242BGS-VK	IC, REAL TIME CLOCK				
U24	PST518B	IC, RESET				
U25	HD14066BP	IC, QUAD ANALOG SW/QUAD MPX				

* * * P A R T S L I S T * * *

X77-1720-00

REF. NO	PARTS NO	NAME & DESCRIPTION
U26	HD74HC08FP	IC, QUAD 2-INPUT AND GATE
U27	HD74HC04FP	IC, HEX INVERTER
U28	HD74LS157FP	IC, 2 TO 1 DATA SELECTORS
U29	HD74LS157FP	IC, 2 TO 1 DATA SELECTORS
U30	HD74LS107AFP	IC, QUAD JK-FF WITH CLEAR
U31	HD74LS11FP	IC, TRIPLE 3-INPUT AND
U32	T93-0752-04	PROGRAMMED ROM
U33	CTM5020	IC, GATE ARRAY OP 0V
U34	HD74HC174FP	IC, HEX D-TYPE FLIP-FLOP
U35	AM6012DC	IC, 12-BIT D/A CONVERTER
U36	HD14051BFP	IC, 8-CH ANALOG MPX/DE-MPX
U37	HD14051BFP	IC, 8-CH ANALOG MPX/DE-MPX
U38	HD14051BFP	IC, 8-CH ANALOG MPX/DE-MPX
U39	HD14052BFP	IC, DUAL 4-CH ANALOG MPX/DE-MPX
U40	HD14052BFP	IC, DUAL 4-CH ANALOG MPX/DE-MPX
U41	HD74HC244FP	IC, OCTAL BUS BUFFER
U42	NJM072M	IC, DUAL J-FET INPUT OP-AMP
U43	NJM072M	IC, DUAL J-FET INPUT OP-AMP
U44	NJM072M	IC, DUAL J-FET INPUT OP-AMP
U45	NJM072M	IC, DUAL J-FET INPUT OP-AMP
U46	HD74HC00FP	IC, QUAD 2 INPUT NAND GATE
U47	NJM311M	IC, VOLTAGE COMPARATOR
U48	DAC0808LCN	IC, 8-BIT D/A CONVERTER
U49	HD74HC564FP	IC, OCTAL D-TYPE FLIP-FLOP
U50	HD74HC574FP	IC, OCTAL D-F.F. (3-S)
U51	HD14051BFP	IC, 8-CH ANALOG MPX/DE-MPX
U52	NJM072M	IC, DUAL J-FET INPUT OP-AMP
U53	NJM072M	IC, DUAL J-FET INPUT OP-AMP
X2	L77-1229-05	CRYSTAL RESONATOR

STORAGE UNIT

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P A R T S L I S T

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(X77-1730-00)

REF. NO	PARTS NO	NAME & DESCRIPTION			
	J73-0120-02	PCB (UNMOUNTED)			
C1	CE04EW1C101M	CAP. ELECTRO	100	20%	16V
C2	CE04EW1C101M	CAP. ELECTRO	100	20%	16V
C3	CE04EW1C101M	CAP. ELECTRO	100	20%	16V
C4	CE04EW1C101M	CAP. ELECTRO	100	20%	16V
C5	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C6	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C7	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C8	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C9	NO USE				
C10	C90-3049-05	CAP. METAL FILM	1	1%	100V
C11	CC45FCH1H100D	CAP. CERAMIC	10P	0.5P	50V
C12	CC45FCH1H100D	CAP. CERAMIC	10P	0.5P	50V
C13	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C61	CE04EW1C100M	CAP. ELECTRO	10	20%	16V
C62	CE04EW1C220M	CAP. ELECTRO	22	20%	16V
C63	CE04EW1C220M	CAP. ELECTRO	22	20%	16V
C64	CE04EW1C220M	CAP. ELECTRO	22	20%	16V
C65	CE04EW1C220M	CAP. ELECTRO	22	20%	16V
C66	NO USE				
C67	CE04EW1C220M	CAP. ELECTRO	22	20%	16V
C71	CC45FCH1H221J	CAP. CERAMIC	220P	5%	50V
C72	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C73	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C74	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C81	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C120	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C121	NO USE				
C122	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C130	CE04EW1E220M	CAP. ELECTRO	22	20%	25V
C140	CC45FSL1H101J	CAP. CERAMIC	100P	5%	50V
C143	CC45FSL1H101J	CAP. CERAMIC	100P	5%	50V
C150	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C171	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C172	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C173	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C174	NO USE				
C175	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C176	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C180	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C181	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C186	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C187	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C188	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C189	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C190	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C201	CK45FF1H103Z	CAP. CERAMIC	0.01		50V

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P A R T S L I S T

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X77-1730-00

REF. NO	PARTS NO	NAME & DESCRIPTION			
C202	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C203	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C204	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C205	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C206	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C207	NO USE				
C208	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C209	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C210	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C211	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C212	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C213	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C214	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C215	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C216	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C221	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C222	CE04EW1E470M	CAP. ELECTRO	47	20%	25V
C223	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C224	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C225	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C228	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C229	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C230	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C231	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
D10	1SS132	DIODE			
D11	1SS132	DIODE			
D12	1SS132	DIODE			
D13	MA700	DIODE			
D130	MTZ4.7JC	DIODE, ZENER	9.6V		
L1	L40-1011-03	FERRI INDUCTOR	100UH	10%	
L5	L40-1011-03	FERRI INDUCTOR	100UH	10%	
L6	L40-1011-03	FERRI INDUCTOR	100UH	10%	
P2	E40-7208-05	PIN CONNECTOR	26P		
P3	E40-7209-05	PIN CONNECTOR	50P		
P4	E40-7035-05	SOCKET	40P		
P5	NO USE				
P6	E40-3243-05	PIN CONNECTOR	8P		
P7	E40-5066-05	PIN CONNECTOR	9P		
P101	E40-3238-05	PIN CONNECTOR	3P		
Q41	2SK583	FET, N-CHANNEL			
Q120	2SA1175(F)	TR. SI, PNP			
Q162	2SA1175(F)	TR. SI, PNP			
R111	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R112	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R113	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R114	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R115	RD14BB2C103J	RES. CARBON	10K	5%	1/6W

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X77-1730-00

REF. NO	PARTS NO	NAME & DESCRIPTION
R116	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R117	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R118	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R119	NO USE	
R120	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R121	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R122	RD14BB2C182J	RES. CARBON 1.8K 5% 1/6W
R123	RD14BB2C222J	RES. CARBON 2.2K 5% 1/6W
R124	RD14BB2C302J	RES. CARBON 3K 5% 1/6W
R125	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R126	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R127	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R128	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R129	RD14BB2C273J	RES. CARBON 27K 5% 1/6W
R130	NO USE	
R131	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R132	RD14BB2C471J	RES. CARBON 470 5% 1/6W
R133	RD14BB2C272J	RES. CARBON 2.7K 5% 1/6W
R134	RD14BB2C682J	RES. CARBON 6.8K 5% 1/6W
R135	RD14BB2C823J	RES. CARBON 82K 5% 1/6W
R136	RD14BB2C682J	RES. CARBON 6.8K 5% 1/6W
R137	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R138	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R139	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R140	NO USE	
R141	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R142	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R157	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R158	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R159	RD14BB2C100J	RES. CARBON 10 5% 1/6W
R160	RD14BB2C332J	RES. CARBON 3.3K 5% 1/6W
R161	RD14BB2C562J	RES. CARBON 5.6K 5% 1/6W
R162	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R163	RD14BB2C221J	RES. CARBON 220 5% 1/6W
R164	RD14BB2C221J	RES. CARBON 220 5% 1/6W
R165	RD14BB2C221J	RES. CARBON 220 5% 1/6W
R166	RD14BB2C221J	RES. CARBON 220 5% 1/6W
R167	RD14BB2C470J	RES. CARBON 47 5% 1/6W
R168	RD14BB2C470J	RES. CARBON 47 5% 1/6W
RA1	R90-0612-05	RES. NETWORK 8X4.7K
RA2	R90-0612-05	RES. NETWORK 8X4.7K
RA3	R90-0612-05	RES. NETWORK 8X4.7K
RA4	R90-1122-05	RES. NETWORK 8X150
RA5	R90-1123-05	RES. NETWORK 8X220
RA6	R90-1123-05	RES. NETWORK 8X220
RA7	R90-1123-05	RES. NETWORK 8X220
RA8	R90-1122-05	RES. NETWORK 8X150
U80	MAX232CPE	IC, RS-232C DRIVERS/RECEIVERS
U81	HD64180R1CP8X	IC, CPU
U82	HD74HC244FP	IC, OCTAL BUS BUFFER
U83	HD74HC244FP	IC, OCTAL BUS BUFFER
U84	HD74HC244FP	IC, OCTAL BUS BUFFER
U85	HD74HC245FP	IC, OCTAL 3-S BUS TRANSCEIVER
U86	SN75160AN	IC, INTERFACE BUS TRANSCEIVER
U87	SN75161AN	IC, INTERFACE BUS TRANSCEIVER
U88	UPD7210C	IC, GP-IB CONTROLLER

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X77-1730-00

REF. NO	PARTS NO	NAME & DESCRIPTION
U89	MB84256-10LL-FP	IC,S-RAM
U90	MB8464-10LL-FP	IC,S-RAM
U91	HD74HC125FP	IC,QUAD BUS BUFFER (3-S)
U92	CTM5120	IC,GATE ARRAY
U95	T93-0753-04	IC,PROGRAMMED ROM
U105	MB84256-10LL-FP	IC,S-RAM
U106	HD74HC238FP	IC,3-TO-8 LINE DECODER
U107	HD74HC138FP	IC,3-8 DECOD./DE-MPX
U108	HD74HC574FP	IC,OCTAL D-F.F. (3-S)
U109	HD74HC541FP	IC,OCTAL 3-S BUFFER/LINE DRIVE
U110	NO USE	
U111	HD74HC08FP	IC,QUAD 2-INPUT AND GATE
U112	NO USE	
U113	HD74HC74FP	IC,DUAL D-F.F.
U114	HD74HC00FP	IC,QUAD 2 INPUT NAND GATE
U120	HD74HC574FP	IC,OCTAL D-F.F. (3-S)
U121	HD74LS74FP	IC,DUAL D-F.F. (WITH PR&CLR)
U122	NO USE	
U123	HD74LS161FP	IC,STNC. 4-BIT BINARY COUNTER
U124	HD74LS161FP	IC,STNC. 4-BIT BINARY COUNTER
U127	HD74HC574FP	IC,OCTAL D-F.F. (3-S)
U128	SN74ALS74AN	IC,DUAL D-F.F. (WITH PR&CLR)
U129	NJM360M	IC,DIFFERENTIAL COMPARATOR
U130	SN74S196N	IC,LATCH
U131	SN74F74N	IC,DUAL D-FLIP FLOP
U132	HD74HC161FP	IC,SYNC. 4-BIT COUNTER
U133	SN74AS153N	IC,DUAL 4-1 DATA SELECTOR/MPX
U134	SPG-8650-0	IC,PROGRAMMABLE DEMULTIPLIER
U135	HD74HC74FP	IC,DUAL D-F.F.
U136	HD74HC238FP	IC,3-TO-8 LINE DECODER
U137	SN74ALS74AN	IC,DUAL D-F.F. (WITH PR&CLR)
U138	HD74HC574FP	IC,OCTAL D-F.F. (3-S)
U139	HD74HC592FP	IC,8-BIT REGISTER BINARY COUNT
U140	HD74HC592FP	IC,8-BIT REGISTER BINARY COUNT
U141	HD74HC592FP	IC,8-BIT REGISTER BINARY COUNT
U142	HD74HC592FP	IC,8-BIT REGISTER BINARY COUNT
U143	HD74HC592FP	IC,8-BIT REGISTER BINARY COUNT
U148	AM6012DC	IC,12-BIT D/A CONVERTER
U149	HD74HC4040FP	IC,12-BIT BINARY COUNTER
U150	NJM072M	IC,DUAL J-FET INPUT OP-AMP
U151	NO USE	
U152	SN74ALS04AN	IC,HEX INVERTER
U153	HD74HC245FP	IC,OCTAL 3-S BUS TRANSCEIVER
U154	HD74HC574FP	IC,OCTAL D-F.F. (3-S)
U155	HD74LS153FP	IC,DUAL 4-1 DATA SELECT./MPX
U156	HD74HC244FP	IC,OCTAL BUS BUFFER
U157	HD74HC244FP	IC,OCTAL BUS BUFFER
VR11	R12-2523-05	RES. SEMI FIXED 5KB
VR12	R12-3551-05	RES. SEMI FIXED 10KB
X3	L77-1071-05	CRYSTAL RESONATOR
X4	L77-1069-05	CRYSTAL RESONATOR

A/D CONVERTER UNIT

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P A R T S L I S T

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(X78-1080-00)

REF. NO	PARTS NO	NAME & DESCRIPTION			
	J73-0118-12	PCB (UNMOUNTED)			
C3	CC45FCH1H080D	CAP. CERAMIC	8P	0.5P	50V
C4	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C5	NO USE				
C6	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C12	CE04EW1C470M	CAP. ELECTRO	47	20%	16V
C13	CE04EW1C470M	CAP. ELECTRO	47	20%	16V
C16	CC45FCH1H080D	CAP. CERAMIC	8P	0.5P	50V
C19	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C20	NO USE				
C21	CC45FCH1H270J	CAP. CERAMIC	27P	5%	50V
C22	NO USE				
C23	CC45FCH1H270J	CAP. CERAMIC	27P	5%	50V
C24	NO USE				
C25	CE04EW1C470M	CAP. ELECTRO	47	20%	16V
C26	CE04EW1C470M	CAP. ELECTRO	47	20%	16V
C27	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C28	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C29	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C30	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C31	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C32	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C33	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C34	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C35	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C36	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C37	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C38	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C39	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C40	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C41	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C42	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C43	NO USE				
C44	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C45	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C46	CC45FCH1H121J	CAP. CERAMIC	120P	5%	50V
C47	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C48	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C49	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C50	CE04EW1C101M	CAP. ELECTRO	100	20%	16V
C51	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C52	NO USE				
C53	CC45FCH1H270J	CAP. CERAMIC	27P	5%	50V
C54	CC45FCH1H270J	CAP. CERAMIC	27P	5%	50V
C61	CC45FCH1H150J	CAP. CERAMIC	15P	5%	50V
C62	CC45FCH1H180J	CAP. CERAMIC	18P	5%	50V
C63	CC45FCH1H100D	CAP. CERAMIC	10P	0.5P	50V
C64	CK45FB1H222K	CAP. CERAMIC	2200P	10%	50V
C71	CE04EW1C100M	CAP. ELECTRO	10	20%	16V
C72	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C77	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C82	CK45FF1H103Z	CAP. CERAMIC	0.01		50V

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X78-1080-00

REF. NO	PARTS NO	NAME & DESCRIPTION			
C101	CE04EW1C470M	CAP. ELECTRO	47	20%	16V
C102	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C106	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C110	CE04EW1C470M	CAP. ELECTRO	47	20%	16V
C111	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C112	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C113	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C120	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C142	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C145	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C146	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C149	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C150	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C151	CC45FSL1H331J	CAP. CERAMIC	330P	5%	50V
C155	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C156	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C157	CE04EW1C470M	CAP. ELECTRO	47	20%	16V
C158	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C159	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C160	CE04EW1C470M	CAP. ELECTRO	47	20%	16V
C161	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C162	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C163	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C180	CK45FB1H102K	CAP. CERAMIC	1000P	10%	50V
C226	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C227	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C301	CE04EW1C101M	CAP. ELECTRO	100	20%	16V
C302	CE04EW1C101M	CAP. ELECTRO	100	20%	16V
C303	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C304	CE04EW1C101M	CAP. ELECTRO	100	20%	16V
C305	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C306	CE04EW1C101M	CAP. ELECTRO	100	20%	16V
C307	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C308	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C309	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C310	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C311	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C312	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C313	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C314	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C320	CC45FCH1H151J	CAP. CERAMIC	150P	5%	50V
C321	CC45FCH1H100D	CAP. CERAMIC	10P	0.5P	50V
C325	CC45FCH1H330J	CAP. CERAMIC	33P	5%	50V
C329	CC45FCH1H150J	CAP. CERAMIC	15P	5%	50V
C330	NO USE				

* * * P A R T S L I S T * * *

X78-1080-00

REF. NO	PARTS NO	NAME & DESCRIPTION
C331	CC45FCH1H030C	CAP. CERAMIC 3P 0.25P 50V
C332	NO USE	
C333	CC45FCH1H030C	CAP. CERAMIC 3P 0.25P 50V
C355	CC45FCH1H330J	CAP. CERAMIC 33P 5% 50V
C359	CC45FCH1H150J	CAP. CERAMIC 15P 5% 50V
C360	NO USE	
C361	CC45FCH1H390J	CAP. CERAMIC 39P 5% 50V
C367	CC45FCH1H390J	CAP. CERAMIC 39P 5% 50V
C372	CC45CH1H220J	CAP. CERAMIC 22P 5% 50V
C373	NO USE	
C374	CC45CH1H220J	CAP. CERAMIC 22P 5% 50V
C382	CC45FCH1H040C	CAP. CERAMIC 4P 0.25P 50V
C383	NO USE	
C384	CC45FCH1H040C	CAP. CERAMIC 4P 0.25P 50V
C601	CQ92FM1H103K	CAP. MYLAR 0.01 10% 50V
C602	CK45FB1H102K	CAP. CERAMIC 1000P 10% 50V
C701	CQ92FM1H103K	CAP. MYLAR 0.01 10% 50V
C702	CK45FB1H102K	CAP. CERAMIC 1000P 10% 50V
C703	CC45FSL1H101J	CAP. CERAMIC 100P 5% 50V
D1	1SS132	DIODE
D2	1SS132	DIODE
D3	NO USE	
D4	1SS132	DIODE
D5	1SS132	DIODE
D6	1SS132	DIODE
D7	MA700	DIODE
D8	MA700	DIODE
D11	HSM88AS	DIODE
D12	HSM88AS	DIODE
D15	1SS132	DIODE
D16	1SS132	DIODE
D17	1SS132	DIODE
D18	1SS132	DIODE
D19	1SS132	DIODE
D20	NO USE	
D21	1SS132	DIODE
D22	HSM88AS	DIODE
D23	HSM88AS	DIODE
D26	MA700	DIODE
D27	MA700	DIODE
D30	1SS132	DIODE
D31	MA700	DIODE
D32	MA700	DIODE
D81	MA700	DIODE
D82	MA700	DIODE

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P A R T S L I S T

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X78-1080-00

REF. NO	PARTS NO	NAME & DESCRIPTION			
D152	MA700	DIODE			
D301	1SS132	DIODE			
JW1	E38-0449-05	WIRE ASS'Y			
L2	L40-1011-03	FERRI INDUCTOR	100UH	10%	
P1	E40-3238-05	PIN CONNECTOR	3P		
P2	E40-3238-05	PIN CONNECTOR	3P		
P3	E40-7209-05	PIN CONNECTOR	50P		
P4	E40-7035-05	SOCKET	40P		
P5	NO USE				
P6	E40-3241-05	PIN CONNECTOR	6P		
Q1	2SC3354(S)	TR. SI, NPN			
Q2	2SC3354(S)	TR. SI, NPN			
Q3	2SC3779(D)	TR. SI, NPN			
Q4	2SC3354(S)	TR. SI, NPN			
Q5	2SC3779(D)	TR. SI, NPN			
Q6	2SA1206(K)	TR. SI, PNP			
Q7	2SA1206(K)	TR. SI, PNP			
Q8	2SK241(Y)	FET, N-CHANNEL			
Q9	2SK241(Y)	FET, N-CHANNEL			
Q10	2SC3354(S)	TR. SI, NPN			
Q11	2SC2785(F)	TR. SI, NPN			
Q12	2SC2785(F)	TR. SI, NPN			
Q13	2SC3354(S)	TR. SI, NPN			
Q14	2SC3354(S)	TR. SI, NPN			
Q15	2SC3354(S)	TR. SI, NPN			
Q16	2SC3779(D)	TR. SI, NPN			
Q17	2SC3779(D)	TR. SI, NPN			
Q18	2SA1206(K)	TR. SI, PNP			
Q19	2SA1206(K)	TR. SI, PNP			
Q20	2SK241(Y)	FET, N-CHANNEL			
Q21	2SK241(Y)	FET, N-CHANNEL			
Q22	2SC3354(S)	TR. SI, NPN			
Q23	2SC2785(F)	TR. SI, NPN			
Q24	2SC2785(F)	TR. SI, NPN			
Q52	2SC3354(S)	TR. SI, NPN			
Q303	2SA1565	TR. SI, PNP			
Q601	2SK583	FET, N-CHANNEL			
Q602	2SK583	FET, N-CHANNEL			
Q701	2SK583	FET, N-CHANNEL			
Q702	2SK583	FET, N-CHANNEL			
R1	RD14BB2C510J	RES. CARBON	51	5%	1/6W
R2	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R3	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R4	RD14BB2C162J	RES. CARBON	1.6K	5%	1/6W
R5	RD14BB2C162J	RES. CARBON	1.6K	5%	1/6W
R6	RD14BB2C431J	RES. CARBON	430	5%	1/6W
R7	RD14BB2C512J	RES. CARBON	5.1K	5%	1/6W
R8	RN14BK2C4700F	RES. METAL FILM	470	1%	1/6W
R9	RN14BK2C4700F	RES. METAL FILM	470	1%	1/6W

* * * P A R T S L I S T * * *

X78-1080-00

REF. NO	PARTS NO	NAME & DESCRIPTION			
R10	RD14BB2C271J	RES. CARBON	270	5%	1/6W
R11	NO USE				
R12	RD14BB2C302J	RES. CARBON	3K	5%	1/6W
R13	RD14BB2C393J	RES. CARBON	39K	5%	1/6W
R14	RD14BB2C112J	RES. CARBON	1.1K	5%	1/6W
R15	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R16	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R17	RD14BB2C202J	RES. CARBON	2K	5%	1/6W
R18	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R19	RD14BB2C152J	RES. CARBON	1.5K	5%	1/6W
R20	RD14BB2C471J	RES. CARBON	470	5%	1/6W
R21	NO USE				
R22	RD14BB2C560J	RES. CARBON	56	5%	1/6W
R23	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R24	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R25	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R26	RD14BB2C680J	RES. CARBON	68	5%	1/6W
R27	RD14BB2C122J	RES. CARBON	1.2K	5%	1/6W
R28	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R31	RD14BB2C510J	RES. CARBON	51	5%	1/6W
R32	RD14BB2C222J	RES. CARBON	2.2K	5%	1/6W
R33	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R34	RD14BB2C162J	RES. CARBON	1.6K	5%	1/6W
R35	RD14BB2C162J	RES. CARBON	1.6K	5%	1/6W
R36	RD14BB2C431J	RES. CARBON	430	5%	1/6W
R37	RD14BB2C512J	RES. CARBON	5.1K	5%	1/6W
R38	RN14BK2C4700F	RES. METAL FILM	470	1%	1/6W
R39	RN14BK2C4700F	RES. METAL FILM	470	1%	1/6W
R40	RD14BB2C271J	RES. CARBON	270	5%	1/6W
R41	NO USE				
R42	RD14BB2C302J	RES. CARBON	3K	5%	1/6W
R43	RD14BB2C393J	RES. CARBON	39K	5%	1/6W
R44	RD14BB2C112J	RES. CARBON	1.1K	5%	1/6W
R45	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R46	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R47	RD14BB2C202J	RES. CARBON	2K	5%	1/6W
R48	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R49	RD14BB2C152J	RES. CARBON	1.5K	5%	1/6W
R50	RD14BB2C471J	RES. CARBON	470	5%	1/6W
R51	NO USE				
R52	RD14BB2C560J	RES. CARBON	56	5%	1/6W
R53	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R54	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R55	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R56	RD14BB2C680J	RES. CARBON	68	5%	1/6W
R57	RD14BB2C122J	RES. CARBON	1.2K	5%	1/6W
R58	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R59	RD14BB2C302J	RES. CARBON	3K	5%	1/6W
R60	NO USE				
R61	RD14BB2C162J	RES. CARBON	1.6K	5%	1/6W
R62	RD14BB2C222J	RES. CARBON	2.2K	5%	1/6W
R63	RD14BB2C302J	RES. CARBON	3K	5%	1/6W
R64	RN14BK2C1001F	RES. METAL FILM	1K	1%	1/6W
R65	RD14BB2C222J	RES. CARBON	2.2K	5%	1/6W
R66	NO USE				
R67	RD14BB2C162J	RES. CARBON	1.6K	5%	1/6W
R68	RD14BB2C222J	RES. CARBON	2.2K	5%	1/6W
R69	RD14BB2C822J	RES. CARBON	8.2K	5%	1/6W

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X78-1080-00

REF. NO	PARTS NO	NAME & DESCRIPTION
R70	RN14BK2C1001F	RES. METAL FILM 1K 1% 1/6W
R71	RD14BB2C822J	RES. CARBON 8.2K 5% 1/6W
R72	RN14BK2C2001F	RES. METAL FILM 2K 1% 1/6W
R73	NO USE	
R74	RN14BK2C2001F	RES. METAL FILM 2K 1% 1/6W
R75	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R76	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R77	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R78	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R81	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R82	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R152	RD14BB2C821J	RES. CARBON 820 5% 1/6W
R171	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R172	NO USE	
R173	RD14BB2C332J	RES. CARBON 3.3K 5% 1/6W
R174	RN14BK2C4701F	RES. METAL FILM 4.7K 1% 1/6W
R175	RN14BK2C4701F	RES. METAL FILM 4.7K 1% 1/6W
R176	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R177	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R178	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R179	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R180	NO USE	
R181	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R182	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R183	RD14BB2C182J	RES. CARBON 1.8K 5% 1/6W
R184	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R185	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R186	RD14BB2C562J	RES. CARBON 5.6K 5% 1/6W
R187	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R188	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R189	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R190	RD14BB2C112J	RES. CARBON 1.1K 5% 1/6W
R191	RD14BB2C183J	RES. CARBON 18K 5% 1/6W
R192	RD14BB2C132J	RES. CARBON 1.3K 5% 1/6W
R193	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R194	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R195	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R196	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R197	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R198	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R199	RD14BB2C562J	RES. CARBON 5.6K 5% 1/6W
R200	RD14BB2C223J	RES. CARBON 22K 5% 1/6W
R201	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R202	NO USE	
R203	RD14BB2C562J	RES. CARBON 5.6K 5% 1/6W
R204	NO USE	
R205	RD14BB2C471J	RES. CARBON 470 5% 1/6W
R206	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R207	RD14BB2C112J	RES. CARBON 1.1K 5% 1/6W
R208	RD14BB2C471J	RES. CARBON 470 5% 1/6W
R209	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R210	RD14BB2C911J	RES. CARBON 910 5% 1/6W
R243	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R244	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R245	RD14BB2C103J	RES. CARBON 10K 5% 1/6W

* * * P A R T S L I S T * * *

X78-1080-00

REF. NO	PARTS NO	NAME & DESCRIPTION
R246	RD14BB2C202J	RES. CARBON 2K 5% 1/6W
R247	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R248	NO USE	
R249	RD14BB2C183J	RES. CARBON 18K 5% 1/6W
R250	RD14BB2C202J	RES. CARBON 2K 5% 1/6W
R251	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R254	RD14BB2C222J	RES. CARBON 2.2K 5% 1/6W
R255	RD14BB2C222J	RES. CARBON 2.2K 5% 1/6W
R258	RD14BB2C392J	RES. CARBON 3.9K 5% 1/6W
R259	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R301	RD14BB2C152J	RES. CARBON 1.5K 5% 1/6W
R302	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R303	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R331	RD14BB2C680J	RES. CARBON 68 5% 1/6W
R332	NO USE	
R333	RD14BB2C680J	RES. CARBON 68 5% 1/6W
R372	RD14BB2C683J	RES. CARBON 68K 5% 1/6W
R373	NO USE	
R374	RD14BB2C683J	RES. CARBON 68K 5% 1/6W
R601	RD14BB2C393J	RES. CARBON 39K 5% 1/6W
R602	RD14BB2C202J	RES. CARBON 2K 5% 1/6W
R603	RD14BB2C105J	RES. CARBON 1M 5% 1/6W
R604	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R701	RD14BB2C393J	RES. CARBON 39K 5% 1/6W
R702	RD14BB2C202J	RES. CARBON 2K 5% 1/6W
R703	RD14BB2C105J	RES. CARBON 1M 5% 1/6W
R704	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
U1	CXD1175AP	IC,A/D CONVERTER
U2	DTM6010	IC,GATE ARRAY
U6	CXK5863P-35	IC,S-RAM
U7	CXK5863P-35	IC,S-RAM
U10	CXD1175AP	IC,A/D CONVERTER
U11	HD74HC157FP	IC,QUAD. 2-1 DATA SELECT./MPX
U12	HD74HC157FP	IC,QUAD. 2-1 DATA SELECT./MPX
U13	HD74HC157FP	IC,QUAD. 2-1 DATA SELECT./MPX
U14	HD74HC157FP	IC,QUAD. 2-1 DATA SELECT./MPX
U15	CXK5863P-35	IC,S-RAM
U16	CXK5863P-35	IC,S-RAM
U17	HD74HC138FP	IC,3-8 DECOD./DE-MPX
U18	SN74AS08N	IC,QUAD 2-INPUT AND GATE
U19	NO USE	
U20	DTM6010	IC,GATE ARRAY
U21	SN74AS74N	IC, DUAL D-F.F.(WITH PR & CLR)
U22	SN74AS74N	IC, DUAL D-F.F.(WITH PR & CLR)
U23	SN74AS04N	IC,HEX INVERTERS
U24	HD74HC161FP	IC,SYNC. 4-BIT COUNTER
U25	HD74HC161FP	IC,SYNC. 4-BIT COUNTER
U26	HD74HC161FP	IC,SYNC. 4-BIT COUNTER

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X78-1080-00

REF. NO	PARTS NO	NAME & DESCRIPTION
U48	HD74HC244FP	IC, OCTAL BUS BUFFER
U49	HD74HC244FP	IC, OCTAL BUS BUFFER
U50	NO USE	
U51	SN74AS04N	IC, HEX INVERTERS
U52	HD74HC08FP	IC, QUAD 2-INPUT AND GATE
U53	HD74HC112FP	IC, DUAL J-K F.F. (WITH PR&CLR)
U54	HD74HC245FP	IC, OCTAL 3-S BUS TRANSCEIVER
U55	MB8464-10LL-FP	IC, S-RAM
U56	HD74HC157FP	IC, QUAD. 2-1 DATA SELECT. /MPX
U57	HD74HC157FP	IC, QUAD. 2-1 DATA SELECT. /MPX
U58	HD74HC157FP	IC, QUAD. 2-1 DATA SELECT. /MPX
U59	HD74HC153FP	IC, DUAL 4-1 DATA SELECT. /MPX
U60	HD74HC4040FP	IC, 12-BIT BINARY COUNTER
U61	HD74HC157FP	IC, QUAD. 2-1 DATA SELECT. /MPX
U62	HD74HC592FP	IC, 8-BIT REGISTER BINARY COUNT
U63	HD74HC592FP	IC, 8-BIT REGISTER BINARY COUNT
U64	HD74HC161FP	IC, SYNC. 4-BIT COUNTER
U65	HD74HC112FP	IC, DUAL J-K F.F. (WITH PR&CLR)
U66	HD74HC574FP	IC, OCTAL D-F.F. (3-S)
U67	HD14052BFP	IC, DUAL 4-CH ANALOG MPX/DE-MPX
U68	HD74HC139FP	IC, DUAL 2-4 DECOD. /DE-MPX
U69	HD74HC112FP	IC, DUAL J-K F.F. (WITH PR&CLR)
U70	HD74HC574FP	IC, OCTAL D-F.F. (3-S)
U71	DAC0800LCN	IC, 8-BIT D/A CONVERTER
U72	HD74HC574FP	IC, OCTAL D-F.F. (3-S)
U73	HD74HC574FP	IC, OCTAL D-F.F. (3-S)
U74	HD74HC574FP	IC, OCTAL D-F.F. (3-S)
U75	AM6012DC	IC, 12-BIT D/A CONVERTER
U76	HD74HC32FP	IC, QUAD. 2-OR
U77	NJM072M	IC, DUAL J-FET INPUT OP-AMP
U78	NJM072M	IC, DUAL J-FET INPUT OP-AMP
U79	HD74HC574FP	IC, OCTAL D-F.F. (3-S)
U80	NJM4558M	IC, DUAL OP-AMP
U81	HD74HC574FP	IC, OCTAL D-F.F. (3-S)
U110	HD14053BFP	IC, TRIPLE 2CH ANALOG MPX/DE-MP
U151	NJM4558M	IC, DUAL OP-AMP
VR5	R12-0580-05	RES. SEMI FIXED 500 B
VR6	R12-2523-05	RES. SEMI FIXED 5KB
VR7	R12-2523-05	RES. SEMI FIXED 5KB
VR8	R12-3551-05	RES. SEMI FIXED 10KB
VR14	R12-2523-05	RES. SEMI FIXED 5KB
VR15	NO USE	
VR16	R12-2523-05	RES. SEMI FIXED 5KB
VR63	R12-4517-05	RES. SEMI FIXED 50K
VR69	R12-4517-05	RES. SEMI FIXED 50K
VR601	R12-3552-05	RES. SEMI FIXED 20KB
VR602	R12-4518-05	RES. SEMI FIXED 50KB
VR701	R12-3552-05	RES. SEMI FIXED 20KB
VR702	R12-4518-05	RES. SEMI FIXED 50KB

FINAL UNIT

(X80-1090-02)

* * * P A R T S L I S T * * *

REF. NO	PARTS NO	NAME & DESCRIPTION
	F01-0859-14	HEAT SINK
	F01-0860-04	HEAT SINK
	J25-5183-22	PCB (UNMOUNTED)
	N09-0626-04	SCREW, SEMS M3X10
	R92-0150-05	JUMPING RES. ZERO OHM(10MM)
C1	CK45F1H103Z	CAP. CERAMIC 0.01 50V
C2	CK45F1H103Z	CAP. CERAMIC 0.01 50V
C3	CC45FSL1H221J	CAP. CERAMIC 220P 5% 50V
C4	CC45FCH1H030C	CAP. CERAMIC 3P 0.25P 50V
C5	NO USE	
C6	CK45F1H103Z	CAP. CERAMIC 0.01 50V
C7	CE04EW1C330M	CAP. ELECTRO 33 20% 16V
C13	CK45FE2H472P	CAP. CERAMIC 4700P 500V
C14	CK45FE2H472P	CAP. CERAMIC 4700P 500V
C19	CK45F1H103Z	CAP. CERAMIC 0.01 50V
C20	CK45F1H103Z	CAP. CERAMIC 0.01 50V
C21	CK45F1H103Z	CAP. CERAMIC 0.01 50V
C22	CK45F1H103Z	CAP. CERAMIC 0.01 50V
C23	CK45F1H103Z	CAP. CERAMIC 0.01 50V
C28	C91-1232-05	CAP. CERAMIC 5.6P 10% 50V
C29	CC45FCH2H010C	CAP. CERAMIC 1P 0.25P 500V
C30	CC45FCH2H010C	CAP. CERAMIC 1P 0.25P 500V
C31	CK45B2H472K	CAP. CERAMIC 4700P 10% 500V
C32	CK45B2H472K	CAP. CERAMIC 4700P 10% 500V
C33	CQ92FM1H104K	CAP. MYLAR 0.1 10% 50V
C34	CQ92FM1H104K	CAP. MYLAR 0.1 10% 50V
C35	CK45F1H103Z	CAP. CERAMIC 0.01 50V
C39	CK45F1H103Z	CAP. CERAMIC 0.01 50V
C40	NO USE	
C41	CK45F1H103Z	CAP. CERAMIC 0.01 50V
C45	CE04EW1C471M	CAP. ELECTRO 470 20% 16V
C46	CE04EW1C471M	CAP. ELECTRO 470 20% 16V
C47	CE04EW2A470M	CAP. ELECTRO 47 20% 100V
C48	CE04W2C100M	CAP. ELECTRO 10 20% 160V
C49	CK45FE2H472P	CAP. CERAMIC 4700P 500V
C50	CE04EW0J682M	CAP. ELECTRO 6800 20% 6.3V
C51	CE04EW0J682M	CAP. ELECTRO 6800 20% 6.3V
C52	CK45F1H103Z	CAP. CERAMIC 0.01 50V
C53	CK45F1H103Z	CAP. CERAMIC 0.01 50V
C54	NO USE	
C55	CC45FSL1H471J	CAP. CERAMIC 470P 5% 50V
C58	CQ92FM1H104K	CAP. MYLAR 0.1 10% 50V
C59	CC45FCH1H470J	CAP. CERAMIC 47P 5% 50V
C60	NO USE	
C61	CC45FCH1H220J	CAP. CERAMIC 22P 5% 50V
C901	CC45FCH1H050C	CAP. CERAMIC 5P 0.25P 50V
C902	CC45FCH1H150J	CAP. CERAMIC 15P 5% 50V
C903	CQ92M1H104K	CAP. MYLAR 0.1 10% 50V
C904	CC45SL1H471J	CAP. CERAMIC 470P 5% 50V
C910	CC45CH1H220J	CAP. CERAMIC 22P 5% 50V
C911	CE04EW1C220M	CAP. ELECTRO 22 20% 16V

* * * P A R T S L I S T * * *

X80-1090-02

REF. NO	PARTS NO	NAME & DESCRIPTION
C912	CE04EW1C220M	CAP. ELECTRO 22 20% 16V
C913	CK45B1H472K	CAP. CERAMIC 4700P 10% 50V
C914	CC45CH1H020C	CAP. CERAMIC 2P 0.25P 50V
C923	CK45B1H472K	CAP. CERAMIC 4700P 10% 50V
D1	MA700	DIODE
D2	MA700	DIODE
D3	MA700	DIODE
D4	1SS132	DIODE
D5	MA700	DIODE
D6	MA700	DIODE
D7	1SS132	DIODE
D8	1SS132	DIODE
D9	NO USE	
D10	1SS132	DIODE
D11	MA700	DIODE
D12	NO USE	
D13	1SS132	DIODE
D14	1SS132	DIODE
D15	1SS132	DIODE
D16	1SS132	DIODE
D17	1SS132	DIODE
D18	1SS132	DIODE
D19	1SS132	DIODE
D20	1SS132	DIODE
D901	1SS132	DIODE
D902	1SS132	DIODE
D903	MA700	DIODE
J250	E40-0318-05	PIN CONNECTOR 3P
J260	E40-0318-05	PIN CONNECTOR 3P
L1	L40-1292-70	FERRI INDUCTOR 1.2UH 10%
L2	L40-6882-70	FERRI INDUCTOR 0.68UH 20%
L3	L40-6882-70	FERRI INDUCTOR 0.68UH 20%
L4	L40-1292-70	FERRI INDUCTOR 1.2UH 10%
P8	E40-3238-05	PIN CONNECTOR 3P
P24	E40-3243-05	PIN CONNECTOR 8P
P41	E40-3241-05	PIN CONNECTOR 6P
P42	E40-3238-05	PIN CONNECTOR 3P
P43	E40-3238-05	PIN CONNECTOR 3P
P250	E40-0311-05	PIN CONNECTOR 3P
P260	E40-0311-05	PIN CONNECTOR 3P
Q1	2SA1206(K)	TR. SI, PNP
Q2	2SA1206(K)	TR. SI, PNP
Q3	2SC3354(S)	TR. SI, NPN
Q4	2SC3354(S)	TR. SI, NPN
Q5	2SC3354(S)	TR. SI, NPN
Q6	2SC3354(S)	TR. SI, NPN
Q7	2SC3354(S)	TR. SI, NPN

* * * P A R T S L I S T * * *

X80-1090-02

REF. NO	PARTS NO	NAME & DESCRIPTION
Q8	2SC3354(S)	TR. SI, NPN
Q9	2SC3354(S)	TR. SI, NPN
Q10	2SC3354(S)	TR. SI, NPN
Q11	2SC3779(D)	TR. SI, NPN
Q12	NO USE	
Q13	2SC3779(D)	TR. SI, NPN
Q14	NO USE	
Q15	2SC3596(E)	TR. SI, NPN
Q16	2SC3596(E)	TR. SI, NPN
Q17	2SC3315(D)	TR. SI, NPN
Q18	2SC3315(D)	TR. SI, NPN
Q19	2SA1005(K)	TR. SI, PNP
Q20	2SA1005(K)	TR. SI, PNP
Q23	2SC2785(F)	TR. SI, NPN
Q24	2SC2785(F)	TR. SI, NPN
Q25	2SC3354(S)	TR. SI, NPN
Q26	2SC3354(S)	TR. SI, NPN
Q27	2SC3354(S)	TR. SI, NPN
Q28	2SC3354(S)	TR. SI, NPN
Q29	2SA1175(F)	TR. SI, PNP
Q30	2SA1175(F)	TR. SI, PNP
Q31	2SC2785(F)	TR. SI, NPN
Q32	2SC2785(F)	TR. SI, NPN
Q33	2SC3354(S)	TR. SI, NPN
Q34	2SC3354(S)	TR. SI, NPN
Q35	2SC3354(S)	TR. SI, NPN
Q36	2SC3354(S)	TR. SI, NPN
Q37	2SC2911(S)	TR. SI, NPN
Q38	2SA1209(S)	TR. SI, PNP
Q39	2SC2911(S)	TR. SI, NPN
Q40	2SA1209(S)	TR. SI, PNP
Q41	NO USE	
Q42	2SA1005(K)	TR. SI, PNP
Q43	2SA1005(K)	TR. SI, PNP
Q44	2SC2786(K)	TR. SI, NPN
Q45	2SC2786(K)	TR. SI, NPN
Q46	NO USE	
Q47	2SC3315(D)	TR. SI, NPN
Q48	2SC3315(D)	TR. SI, NPN
Q49	2SC2785(F)	TR. SI, NPN
Q50	2SA1005(K)	TR. SI, PNP
Q51	2SC2785(F)	TR. SI, NPN
Q901	2SC2785(F)	TR. SI, NPN
R1	RN14BK2C1000F	RES. METAL FILM 100 1% 1/6W
R2	RN14BK2C1000F	RES. METAL FILM 100 1% 1/6W
R3	RD14BB2C470J	RES. CARBON 47 5% 1/6W
R4	RD14BB2C470J	RES. CARBON 47 5% 1/6W
R5	RD14BB2C751J	RES. CARBON 750 5% 1/6W
R6	RN14BK2C1501F	RES. METAL FILM 1.5K 1% 1/6W
R7	RN14BK2C1501F	RES. METAL FILM 1.5K 1% 1/6W
R8	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R9	RD14BB2C222J	RES. CARBON 2.2K 5% 1/6W
R10	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R11	RD14BB2C222J	RES. CARBON 2.2K 5% 1/6W
R12	RD14BB2C470J	RES. CARBON 47 5% 1/6W
R13	RD14BB2C470J	RES. CARBON 47 5% 1/6W

* * * P A R T S L I S T * * *

X80-1090-02

REF. NO	PARTS NO	NAME & DESCRIPTION			
R14	RD14BB2E470J	RES. CARBON	47	5%	1/4W
R15	RD14BB2E470J	RES. CARBON	47	5%	1/4W
R16	RD14BB2C432J	RES. CARBON	4.3K	5%	1/6W
R17	RD14BB2C432J	RES. CARBON	4.3K	5%	1/6W
R18	RD14BB2C201J	RES. CARBON	200	5%	1/6W
R19	RD14BB2C201J	RES. CARBON	200	5%	1/6W
R20	RN14BK2C1601F	RES. METAL FILM	1.6K	1%	1/6W
R21	RD14BB2C622J	RES. CARBON	6.2K	5%	1/6W
R22	RD14BB2C623J	RES. CARBON	62K	5%	1/6W
R23	NO USE				
R24	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R25	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R26	RN14BK2C8200F	RES. METAL FILM	820	1%	1/6W
R27	RN14BK2C1001F	RES. METAL FILM	1K	1%	1/6W
R28	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R29	RN14BK2C1001F	RES. METAL FILM	1K	1%	1/6W
R30	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R31	RD14BB2C222J	RES. CARBON	2.2K	5%	1/6W
R32	RD14BB2C222J	RES. CARBON	2.2K	5%	1/6W
R33	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R34	NO USE				
R35	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R36	NO USE				
R37	RN14BK2E62R0F	RES. METAL FILM	62.0	1%	1/4W
R38	RN14BK2E62R0F	RES. METAL FILM	62.0	1%	1/4W
R39	RD14BB2C621J	RES. CARBON	620	5%	1/6W
R42	RD14BB2C430J	RES. CARBON	43	5%	1/6W
R48	RD14BB2C681J	RES. CARBON	680	5%	1/6W
R49	RD14BB2C681J	RES. CARBON	680	5%	1/6W
R50	NO USE				
R51	R92-1411-05	RES. SPR5L30	1.2K	5%	5W
R52	R92-1412-05	RES. SPR5L30	1.8K	5%	5W
R53	R92-1412-05	RES. SPR5L30	1.8K	5%	5W
R54	R92-1411-05	RES. SPR5L30	1.2K	5%	5W
R60	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R78	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R79	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R80	RD14BB2C112J	RES. CARBON	1.1K	5%	1/6W
R81	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R82	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R83	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R84	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R87	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R88	RN14BK2C5600F	RES. METAL FILM	560	1%	1/6W
R89	RN14BK2C5600F	RES. METAL FILM	560	1%	1/6W
R90	RD14BB2C361J	RES. CARBON	360	5%	1/6W
R91	RD14BB2C361J	RES. CARBON	360	5%	1/6W
R92	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R93	RD14BB2C221J	RES. CARBON	220	5%	1/6W
R94	NO USE				
R95	RN14BK2C4301F	RES. METAL FILM	4.3K	1%	1/6W
R96	RN14BK2C5601F	RES. METAL FILM	5.6K	1%	1/6W
R97	RN14BK2C8200F	RES. METAL FILM	820	1%	1/6W
R98	RN14BK2C8200F	RES. METAL FILM	820	1%	1/6W

* * * P A R T S L I S T * * *

X80-1090-02

REF. NO	PARTS NO	NAME & DESCRIPTION			
R99	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R100	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R101	RN14BK2C2001F	RES. METAL FILM	2K	1%	1/6W
R102	RN14BK2C2001F	RES. METAL FILM	2K	1%	1/6W
R103	RD14BB2C392J	RES. CARBON	3.9K	5%	1/6W
R104	RD14BB2C392J	RES. CARBON	3.9K	5%	1/6W
R105	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R106	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R107	RN14BK2C1101F	RES. METAL FILM	1.1K	1%	1/6W
R108	RN14BK2C1101F	RES. METAL FILM	1.1K	1%	1/6W
R109	NO USE				
R110	RD14BB2C151J	RES. CARBON	150	5%	1/6W
R111	RD14BB2C364J	RES. CARBON	360K	5%	1/6W
R112	RN14BK2C3001F	RES. METAL FILM	3K	1%	1/6W
R113	RN14BK2C3001F	RES. METAL FILM	3K	1%	1/6W
R114	RD14BB2C392J	RES. CARBON	3.9K	5%	1/6W
R115	RD14BB2C392J	RES. CARBON	3.9K	5%	1/6W
R116	RN14BK2H3902F	RES. METAL FILM	39K	1%	1/2W
R117	RN14BK2H3902F	RES. METAL FILM	39K	1%	1/2W
R118	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R119	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R120	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R121	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R122	RN14BK2C4301F	RES. METAL FILM	4.3K	1%	1/6W
R123	RN14BK2C1003F	RES. METAL FILM	100K	1%	1/6W
R124	RN14BK2C1201F	RES. METAL FILM	1.2K	1%	1/6W
R125	RN14BK2C1201F	RES. METAL FILM	1.2K	1%	1/6W
R126	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R127	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R128	RD14BB2C682J	RES. CARBON	6.8K	5%	1/6W
R129	RD14BB2C392J	RES. CARBON	3.9K	5%	1/6W
R130	NO USE				
R131	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R132	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R150	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R156	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R157	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R160	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R161	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W
R162	RD14BB2C392J	RES. CARBON	3.9K	5%	1/6W
R163	RD14BB2C392J	RES. CARBON	3.9K	5%	1/6W
R164	RD14BB2C562J	RES. CARBON	5.6K	5%	1/6W
R165	RD14BB2C301J	RES. CARBON	300	5%	1/6W
R166	RD14BB2C201J	RES. CARBON	200	5%	1/6W
R167	RD14BB2C201J	RES. CARBON	200	5%	1/6W
R168	RD14BB2C201J	RES. CARBON	200	5%	1/6W
R169	RD14BB2C622J	RES. CARBON	6.2K	5%	1/6W
R170	RD14BB2C432J	RES. CARBON	4.3K	5%	1/6W
R171	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R172	NO USE				
R173	RD14BB2C331J	RES. CARBON	330	5%	1/6W
R174	RD14BB2C242J	RES. CARBON	2.4K	5%	1/6W
R175	RD14BB2C821J	RES. CARBON	820	5%	1/6W
R176	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W
R177	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R178	RD14BB2C622J	RES. CARBON	6.2K	5%	1/6W

* * * P A R T S L I S T * * *

X80-1090-02

REF. NO	PARTS NO	NAME & DESCRIPTION			
R179	RD14BB2C302J	RES. CARBON	3K	5%	1/6W
R180	RD14BB2C682J	RES. CARBON	6.8K	5%	1/6W
R181	RN14BK2C6800F	RES. METAL FILM	680	1%	1/6W
R182	RD14BB2C112J	RES. CARBON	1.1K	5%	1/6W
R183	RD14BB2C242J	RES. CARBON	2.4K	5%	1/6W
R184	RD14BB2C821J	RES. CARBON	820	5%	1/6W
R185	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W
R186	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R187	RD14BB2C471J	RES. CARBON	470	5%	1/6W
R188	RN14BK2C1001F	RES. METAL FILM	1K	1%	1/6W
R189	RN14BK2C1001F	RES. METAL FILM	1K	1%	1/6W
R190	NO USE				
R191	RD14BB2C622J	RES. CARBON	6.2K	5%	1/6W
R192	RD14BB2C272J	RES. CARBON	2.7K	5%	1/6W
R193	RD14BB2C122J	RES. CARBON	1.2K	5%	1/6W
R194	NO USE				
R195	RD14BB2C471J	RES. CARBON	470	5%	1/6W
R196	RN14BK2C6801F	RES. METAL FILM	6.8K	1%	1/6W
R197	RN14BK2C1501F	RES. METAL FILM	1.5K	1%	1/6W
R198	RN14BK2C1300F	RES. METAL FILM	130	1%	1/6W
R199	RD14BB2C272J	RES. CARBON	2.7K	5%	1/6W
R200	RD14BB2C911J	RES. CARBON	910	5%	1/6W
R201	RD14BB2C301J	RES. CARBON	300	5%	1/6W
R202	RD14BB2C301J	RES. CARBON	300	5%	1/6W
R203	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R206	RD14BB2C223J	RES. CARBON	22K	5%	1/6W
R207	RD14BB2C104J	RES. CARBON	100K	5%	1/6W
R208	RD14BB2C104J	RES. CARBON	100K	5%	1/6W
R209	RD14BB2C104J	RES. CARBON	100K	5%	1/6W
R210	RD14BB2C104J	RES. CARBON	100K	5%	1/6W
R211	RN14BK2C6801F	RES. METAL FILM	6.8K	1%	1/6W
R212	RN14BK2C1301F	RES. METAL FILM	1.3K	1%	1/6W
R213	RN14BK2C2700F	RES. METAL FILM	270	1%	1/6W
R901	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R902	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R903	RD14BB2C152J	RES. CARBON	1.5K	5%	1/6W
R904	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R905	RD14BB2C113J	RES. CARBON	11K	5%	1/6W
R906	RD14BB2C681J	RES. CARBON	680	5%	1/6W
R910	RD14BB2C470J	RES. CARBON	47	5%	1/6W
R911	RD14BB2C105J	RES. CARBON	1M	5%	1/6W
R912	RD14BB2C240J	RES. CARBON	24	5%	1/6W
R913	RD14BB2C270J	RES. CARBON	27	5%	1/6W
R922	RD14BB2C240J	RES. CARBON	24	5%	1/6W
R923	RD14BB2C270J	RES. CARBON	27	5%	1/6W
TC1	C05-0445-05	CAP. TRIMMER	20P		
TC2	C05-0449-05	CAP. TRIMMER	100P		
TH3	SDT1000	THERMISTOR			
TH4	SDT100	THERMISTOR			
VR1	R12-1539-05	RES. SEMI FIXED	2KB		
VR2	R12-0569-05	RES. SEMI FIXED	100 B		
VR3	R12-0571-05	RES. SEMI FIXED	500 B		

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X80-1090-02

REF. NO	PARTS NO	NAME &	DESCRIPTION
VR4	R12-1538-05	RES.	SEMI FIXED 1KB
VR5	R12-0569-05	RES.	SEMI FIXED 100 B
VR6	R12-4416-05	RES.	SEMI FIXED 50KB
VR7	R12-0570-05	RES.	SEMI FIXED 200 B
VR8	R12-0569-05	RES.	SEMI FIXED 100 B
VR9	R12-0570-05	RES.	SEMI FIXED 200 B
VR10	R12-1538-05	RES.	SEMI FIXED 1KB
VR11	R12-0571-05	RES.	SEMI FIXED 500 B

AC FILTER UNIT

(X80-1230-00)

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P A R T S L I S T

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REF. NO	PARTS NO	NAME & DESCRIPTION
	E38-0354-05	WIRE ASS'Y
	E38-0355-05	WIRE ASS'Y
	F02-0521-03	HEAT SINK
	J73-0122-12	PCB (UNMOUNTED)
	N09-0626-04	SCREW, SEMS M3X10
	R92-0150-05	JUMPING RES. ZERO OHM (10MM)
	R92-1061-05	JUMPING RES. ZERO OHM (5MM)
C1	C90-3050-05	CAP. ELECTRO 10000 20% 25V
C2	NO USE	
C3	CE04EW1C221M	CAP. ELECTRO 220 20% 16V
C4	CQ92FM1H104K	CAP. MYLAR 0.1 10% 50V
C101	CQ92FM1H103K	CAP. MYLAR 0.01 10% 50V
C102	CE04EW1E470M	CAP. ELECTRO 47 20% 25V
C103	CQ92FM1H104K	CAP. MYLAR 0.1 10% 50V
C201	C91-0575-05	CAP. CERAMIC 1000P 20% 4KV
C202	C91-0575-05	CAP. CERAMIC 1000P 20% 4KV
C304	CC45CH2H030C	CAP. CERAMIC 3P 0.25P 500V
C305	CC45CH2H020C	CAP. CERAMIC 2P 0.25P 500V
C601	C91-0551-05	CAP. POLYESTER 0.22 10% 630V
D1	D5SBA10	DIODE, BRIDGE
JW303	E38-0352-25	WIRE ASS'Y
JW304	E38-0353-05	WIRE ASS'Y
JW601	E38-0360-25	WIRE ASS'Y
L201	L33-0808-05	CHOKE COIL
P1	E40-0305-05	PIN CONNECTOR 3P
P2	E40-5067-05	PIN CONNECTOR 10P
P81	E40-3237-05	PIN CONNECTOR 2P
P82	E40-3237-05	PIN CONNECTOR 2P
P201	E40-7104-05	PIN CONNECTOR 4P
P202	E40-7103-05	PIN CONNECTOR 3P
P401	E40-3306-05	PIN CONNECTOR 9P
P402	E40-3305-05	PIN CONNECTOR 8P
P501	E40-3239-05	PIN CONNECTOR 4P
P502	E40-3239-05	PIN CONNECTOR 4P
P503	E40-3239-05	PIN CONNECTOR 4P
R201	RD14BY2H225J	RES. CARBON 2.2M 5% 1/2W
S201	S40-2524-05	PUSH SWITCH; POWER
S401	S62-0608-05	DIP SWITCH
S402	S62-0608-05	DIP SWITCH
U1	SI-3052V	IC, 3-TERMINAL REGULATOR
U2	NJM7912FA	IC, 3-TERMINAL REGULATOR

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X80-1230-00

REF. NO	PARTS NO	NAME & DESCRIPTION
VR501	R23-3506-05	V.R. 1K
VR502	R23-7501-05	V.R. (FOCUS, ASTIG) 500KB X-2
VR503	R23-3503-05	V.R. (ILLUM, ROTAT) 20KB X-2

Z302	E01-0103-05	CRT SOCKET
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ADJUSTMENT

To obtain the best performance, periodically calibrate the unit. Sometimes, only one mode need be calibrated, while at other times, all modes should be calibrated. When one mode is calibrated, it must be noted that the other modes may be affected. When calibrating all modes, perform the calibration in the specified sequence. The following calibration required an accurate measuring instrument and an insulated adjusting flat blade screwdriver. If they are not available, contact your dealer. For optimum adjustment, turn the power on and warm up the scope sufficiently (more than 30 minutes) before starting. Before calibrating the scope, check the power supply voltage.

TEST EQUIPMENT REQUIRED

The following instrument or their equivalent should be used for making adjustment.

Test Equipment	Model	Minimum Specification
Digital Multi-Meter	DL-711 (KENWOOD)	Impedance: More than 10 M Ω , Measuring range: 0.01 V to 199 V
Sine-Wave Generator	651 B (YHP)	Frequency: 10 Hz to 10 MHz, constant voltage over tuning range
Sine-Wave Generator	SG-503 (Tektronix)	Frequency: 50 kHz to 100 MHz, Output impedance: 50 Ω , constant voltage over tuning range
Square-Wave Generator	PG-506 (Tektronix)	Output signal: 1 kHz, Amplitude: 10 mVp-p to 10 Vp-p, Accuracy: within $\pm 1\%$, Rise time: 35ns or less 100 kHz, Rise time: 1 ns or less
Q Meter	4343B (YHP)	—
Color Pattern Generator	CG-911A (KENWOOD)	—
Oscilloscope	CS-6020 (KENWOOD)	Sensitivity: more than 1 mV Frequency response: More than 100 MHz
Time-Marker Generator	TG-501 (Tektronix)	Time mark: 0.5 s to 0.1 μ s repetitive waveform
High-Voltage Probe	—	Input Impedance: 1000 M Ω
Termination	—	Impedance: 50 Ω Accuracy: within 3%
Termination	—	3 watts type impedance: 50 Ω
Attenuator	—	— 20 dB attenuation (50 Ω)

Table 1

PREPARATION FOR ADJUSTMENT

Control Settings

The control settings listed below must be used for each adjustment procedure.

Exceptions to these settings will be noted as they occur. After completing a adjustment, return the controls to the following settings.

NAME OF KNOBS	POSITION
INTEN	12 o'clock
READOUT INTEN	Fully counterwise
FOCUS, ASTIG	Optimum position
CH1, CH2 \blacktriangle POSITION	Mechanical center
\blacktriangleleft \blacktriangleright POSITION	Mechanical center
$\times 10$ MAG/EQU	LED OFF
VARIABLE, H.VARIABLE	CAL
(VOLTS/DIV, SWEEP TIME/DIV)	
AC-GND-DC (CH1 and CH2)	DC (GND at no signal)
VERTICAL MODE	CH1
HORIZONTAL MODE	AUTO
TRIGGERING COUPLING	AC
TRIGGERING SOURCE	CH1
TRIGGERING LEVEL	Mechanical center
VOLTS/DIV (CH1 and CH2)	10 mV/DIV
SWEEP TIME/DIV	1 ms/DIV
PROG SET	Press twice to set to initial setting (the indicator goes off).

Table 2

ADJUSTMENT

1. Power Supply and CRT Section Adjustments

Item	Adjustment	PCB	Procedure
- 10 V	VR1	X68-1480	Adjust VR1 so that the terminal voltage at pin No. 2 of the connector P41 is - 10 V.
Focus Center	VR4	X68-1480	Push the FOCUS knob in (for the FOCUS operation) and then set it to the mechanical center position. Pull the knob out (for the ASTIG operation), display a luminescent spot in the center of the screen and adjust the ASTIG control and VR4 to minimize the size of the spot.
Intensity	VR2	X68-1480	Display the luminescent spot in the center of the screen and turn the REAL-INTEN knob to a 10 o'clock position. Then adjust VR2 so that the spot is dimly visible.
CRT Center	VR2	X80-1090	With Q1-collector and Q2-collector short-circuited, adjust VR2 so that the luminescent line comes to the center of the screen.
Vertical Center Voltage	VR5	X80-1090	With Q1-collector and Q2-collector short-circuited, adjust VR5 to give 37 V at pin No. 1 of the connector P42 so that the luminescent line comes to the center of the screen.
Horizontal Center Voltage	VR9	X80-1090	In X-Y mode, adjust HORIZONTAL POSITION so that the luminescent spot comes to the center of the screen. Adjust VR9 to give 60 V at pin No. 1 of the connector P43.

2. Vertical Section Adjustments

Item	Adjustment	PCB	Procedure
CH1 100 Hz Sag	VR2	X75-1200	CH1 VOLTS/DIV: 10 mV Apply square waves using a square-wave oscillator so that the amplitude extends over 6 divisions on the screen. Adjust VR2 so that the square waves are parallel to each other.
CH2 100 Hz Sag	VR102	X75-1200	Adjust in the same way as for CH1.
CH1 1 kHz Waveform Shaping	TC903 TC904	X75-1200	AC-GND-DC: DC Apply 1 kHz square waves to CH1 INPUT with the amplitude extending over 4 to 6 divisions, then adjust in each range so that leading edges are parallel to each other. TC903 for 0.1 V/div, TC904 for 1 V/div
CH2 1 kHz Waveform Shaping	TC913 TC914	X75-1200	Adjust in the same way as for CH1.
CH1 Input Capacity	TC901 TC902	X75-1200	AC-GND-DC: DC CH1 VOLTS/DIV: 10 mV Connect a capacity meter to CH1 INPUT and measure the capacity in the 10 mV range. Adjust so that the capacities in each range are the same as for the 10 mV range. TC 901 for 0.1 V/div, TC902 for 1 V/div Input capacity: 22 pF \pm 3 pF
CH2 Input Capacity	TC911 TC912	X75-1200	Adjust in the same way as for CH1.
CH1 Step ATT Balance	VR1 VR1	X75-1200 X73-1930	SWEEP TIME/DIV: 1 ms AC-GND-DC: GND Adjust VR1 (X75-1200) so that the luminescent line does not vary even when the range is switched between 1 mV and 2 mV. Adjust VR1 (X73-1930) so that the luminescent line does not vary even when the range is switched between 2 mV and 5 mV.

ADJUSTMENT

Item	Adjustment	PCB	Procedure
CH1 Variable Balance	VR5	X73-1930	VOLTS/DIV: 10 mV SWEEP TIME/DIV: 1 ms Adjust VR5 so that the luminescent line does not move even when the VARIABLE knob is rotated.
CH2 Step ATT Balance	VR101 VR201	X75-1200 X73-1930	Adjust in the same way as for CH1.
CH2 Variable Balance	VR215	X73-1930	Adjust in the same way as for CH1.
CH2 INV Balance	VR216	X73-1930	CH2 POSITION: Display in the center of the screen. CH2 VOLTS/DIV: 1 mV SWEEP TIME/DIV: 1 ms Adjust VR216 so that the luminescent line does not move even when the CH2 INV switch is turned ON/OFF.
CH2 Position Center	VR205	X73-1930	AC-GND-DC: AC CH2 VOLTS/DIV: 10 mV SWEEP TIME/DIV: 1 ms CH2 INPUT: Sine wave with the amplitude extending over approx. 10 divisions on the screen Display CH2 after pressing SET, then adjust VR205 so that it comes to the center.
CH1 Position Center	VR4	X73-1930	Adjust in the same way as for CH2.
CH1 Gain	VR1	X80-1090	AC-GND-DC: DC VOLTS/DIV: 10 mV Apply a 50 mV square wave, and adjust so that the amplitude extends over 5 divisions on the screen.
CH1 1 mV Gain	VR2	X73-1930	AC-GND-DC: DC VOLTS/DIV: 1 mV Apply a 5 mV square wave, and adjust so that the amplitude extends over 5 divisions on the screen.
CH2 Gain	VR206	X73-1930	AC-GND-DC: DC VOLTS/DIV: 10 mV Apply a 50 mV square wave, and adjust so that the amplitude extends over 5 divisions on the screen.
CH2 1 mV Gain	VR202	X73-1930	AC-GND-DC: DC VOLTS/DIV: 1 mV Apply a 5 mV square wave, and adjust so that the amplitude extends over 5 divisions on the screen.
X Gain	VR324	X73-1930	AC-GND-DC: DC CH2 VOLTS/DIV: 10 mV HORIZONTAL MODE: X-Y Apply a 50 mV square wave, and adjust so that the amplitude extends over 5 divisions on the horizontal axis on the screen.

ADJUSTMENT

3. TRIG Section Adjustments

Item	Adjustment	PCB	Procedure
FIX Level Center	VR1	X74-1550	<p>HORIZONTAL MODE : FIX, AUTO TRIGGERING SOURCE : CH1 COUPLING : DC INPUT : Sine wave with the amplitude extending over 4 divisions on the screen</p> <p>Adjust VR1 so that the starting point of the waveform on the screen has the same amplitude in the center of the waveform when switching SLOPE between + (plus) and - (minus).</p>
TRIG Level Center	VR123 VR323 VR428	X73-1930	<p>HORIZONTAL MODE : AUTO TRIGGERING SOURCE : CH1/CH2/EXT (switching) COUPLING : AC/DC (switching) INPUT : Sine wave with the amplitude extending over 4 divisions on the screen</p> <p>Adjust VR1 so that the starting point of the waveform on the screen does not vary when switching COUPLING between AC and DC. (Align the point for DC with that for AC.) VR123 for CH1, VR323 for CH2, VR428 for EXT</p>

4. Horizontal Section Adjustments

Item	Adjustment	PCB	Procedure
1 ms range	VR143	X74-1550	<p>SWEEP TIME/DIV : 1 ms CH1 INPUT : Input 1 ms Time Marker. Adjust VR143 to align the input signal with the scale on the screen.</p>
10 ms range	VR138	X74-1550	<p>SWEEP TIME/DIV : 10 ms CH1 INPUT : Input 10 ms Time Marker. Adjust VR138 to align the input signal with the scale on the screen.</p>
0.2 μ s range	TC128	X74-1550	<p>SWEEP TIME/DIV : 0.2 μs CH1 INPUT : Input 0.2 μs Time Marker. Adjust TC128 to align the input signal with the scale on the screen.</p>
1 μ s range	TC127	X74-1550	<p>SWEEP TIME/DIV : 1 μs CH1 INPUT : Input 1 μs Time Marker. Adjust TC127 to align the input signal with the scale on the screen.</p>
$\times 10$ MAG Gain	VR8	X80-1090	<p>SWEEP TIME/DIV : 1 ms CH1 INPUT : 10 μs Time Marker With $\times 10$MAG KEY on (with the LED lit up), adjust VR8 to align the input signal with the scale on the screen.</p>
$\times 10$ MAG Center	VR7	X80-1090	<p>SWEEP TIME/DIV : 1 ms CH1 INPUT : 5 ms Time Marker With $\times 10$MAG KEY on (with the LED lit up), align the second Time Marker on the screen with the scale in the center using Horizontal Position. With $\times 10$MAG KEY off (with the LED unlit), adjust VR7 to align the second Time Marker with the scale in the center.</p>
Horizontal Position Center	VR6	X80-1090	<p>SWEEP TIME/DIV : 1 ms CH1 INPUT : 10 ms Time Marker Adjust VR6 so that the Marker on the screen displays in the same range when the Position volume is fully turned clockwise and counterclockwise (with 10 divisions for each side).</p>
X Position Center	VR145	X74-1550	<p>SWEEP TIME/DIV : 1 ms Using Horizontal Position, align the starting point of the luminescent line with the scale at the left end on the screen. With Horizontal Mode X-Y Key on (with the LED lit up), adjust VR145 so that the luminescent spot on the screen comes to the center of the screen.</p>

ADJUSTMENT

5. Display System

Item	Adjustment	PCB	Procedure
Y Gain and Position	VR5 VR6	X78-1080	<ul style="list-style-type: none"> * Adjust using a test pattern (stepped-wave) How to output a test pattern 1. Turn the power switch off. (Power off) 2. Turn the power switch on while pressing the AUTO SET switch. (Restart) 3. Release the AUTO SET switch. * Adjust VR5 to align with each division of the Y axis scale on the screen. Move the test pattern in Y direction using VR6 so that VR5 can be adjusted easily. * Adjust VR6 to align the test pattern (stepped-wave) with the Y axis scale on the screen at intervals of 8 divisions.
X Gain and Position	VR7 VR8	X78-1080	<ul style="list-style-type: none"> * Adjust using a test pattern (stepped-wave) * Adjust VR7 to align with each division of the X axis scale on the screen. Move the test pattern in X direction using VR8 so that VR7 can be adjusted easily. * Adjust VR8 to align the test pattern (stepped-wave) with the X axis scale on the screen at intervals of 10 divisions.
X Position	VR8	X78-1080	<p>Stopping the test pattern output Turn the power on again. TIME/DIV : 1 ms</p> <ul style="list-style-type: none"> * Using Horizontal Position, align the starting point of the luminescent line in REAL mode with the scale at the left end on the screen. Adjust VR8 so that the luminescent line starts from the same point even when the mode is changed to STORAGE.

6. AD system

Item	Adjustment	PCB	Procedure
CH1 AD Gain and Position	VR63 VR142	X78-1080 X73-1930	<p>VOLTS/DIV : 10 mV SWEEP TIME/DIV : 0.2 ms CH1 INPUT : 50 mV square wave TRIGGERING MODE : AUTO</p> <ul style="list-style-type: none"> * In REAL mode, display in a position on the screen where adjustment can be performed easily. * Change the mode from REAL to STORAGE, then adjust VRs 63 and 142 so that the gain and the position are the same as for REAL. (Adjust precisely repeating this procedure several times.) VR142 for gain and VR63 for position adjustment.
CH2 AD Gain and Position	VR69 VR342	X78-1080 X73-1930	<p>VOLTS/DIV : 10 mV SWEEP TIME/DIV : 0.2 ms CH1 INPUT : 50 mV square wave TRIGGERING MODE : AUTO</p> <ul style="list-style-type: none"> * In REAL mode, display in a position on the screen where adjustment can be performed easily. * Change the mode from REAL to STORAGE, then adjust VRs 69 and 342 so that the gain and the position are the same as for REAL. (Adjust precisely repeating this procedure several times.) VR342 for gain and VR69 for position adjustment.

ADJUSTMENT

Item	Adjustment	PCB	Procedure
CH1 EQU Mode Gain and Position	VR601 VR602	X78-1080	VOLTS/DIV : 10 mV SWEEP TIME/DIV : 5 μ s CH1 INPUT : 50 kHz sine wave with the amplitude extending over 5 divisions on the screen AC-GND-DC : AC TRIGGERING MODE : AUTO * In STORAGE NORM mode, display in a position on the screen where adjustment can be performed easily. * Switching between NORM and EQU ($\times 10$ MAG), adjust VRs 601 and 602 so that the gain and the position are the same as for REAL. (Adjust precisely repeating this procedure several times.) VR602 for gain and VR601 for position adjustment.
CH2 EQU Mode Gain and Position	VR701 VR702	X78-1080	VOLTS/DIV : 10 mV SWEEP TIME/DIV : 5 μ s CH2 INPUT : 50 kHz sine wave with the amplitude extending over 5 divisions on the screen AC-GND-DC : AC TRIGGERING MODE : AUTO * In STORAGE NORM mode, display in a position on the screen where adjustment can be performed easily. * Switching between NORM and EQU ($\times 10$ MAG), adjust VRs 701 and 702 so that the gain and the position are the same as for REAL. (Adjust precisely repeating this procedure several times.) VR702 for gain and VR701 for position adjustment.
TIME/DIV Gain and Position	VR11 VR12	X77-1730	VOLTS/DIV : 10 mV SWEEP TIME/DIV : 0.1 μ s CH2 INPUT : TIME Marker 0.1 μ s with the amplitude extending over approx. 4 divisions on the screen AC-GND-DC : AC TRIGGERING MODE : AUTO * Display in a position on the screen where adjustment can be performed easily. * Adjust VR11 to align with each division of the X axis scale on the screen. Move in horizontal direction using Horizontal Position so that VR11 can be adjusted easily. (Perform the adjustment operation with the marker signal of F 2% for the purposes of (1) preventing the error due to temperature drift and (2) satisfying the specifications also in the 20 μ s range.) * Adjust VR12 so that the waveform is displayed without any breaks. * Check to make sure that there is no break in the displayed waveform switching the range between TIME/DIV 5 μ s and 20 ns.

ADJUSTMENT

7. Overshoot and CAL Adjustments

Item	Adjustment	PCB	Procedure
Overshoot	TC1 TC2 <for CH1> TC2 VR3 TC3 VR97 TC97 <for CH2> TC202 VR203 TC203 TC280	X80-1090 X73-1930	<p>CH1, 2 VOLTS/DIV : 10 mV CH1, 2 AC-GND-DC: DC SWEEP TIME/DIV : 0.1 μs, 0.2 μs</p> <ul style="list-style-type: none"> • Apply a 1 MHz square wave to CH1 INPUT. <ul style="list-style-type: none"> * In STORAGE EQU mode, adjust TC2, TC3 and VR3 so that both overshoot and ringing extend over 0.3 divisions. * In REAL mode, adjust TC1 and TC2 so that the waveform is flat in the intermediate-frequency band. * In REAL mode, adjust TC97 and VR97 so that both overshoot and ringing extend over 0.3 divisions. • Apply a 1 MHz square wave to CH2 INPUT. <ul style="list-style-type: none"> * In STORAGE EQU mode, adjust TC202, TC203 and VR203 so that both overshoot and ringing extend over 0.3 divisions. * In REAL mode, adjust TC280 so that the waveform is flat in the high-frequency band. (At this point of time, both overshoot and ringing should extend over 0.3 divisions.) <p>Confirmation after adjustments: The frequency characteristics in the 10 mV range should be 55 MHz (–3 dB) or more for each channel. The channel signal difference (between CH1 and CH2 INV ADD) should be 0.5 divisions or less (when applying a 50 MHz square wave with the amplitude extending over 8 divisions).</p>
CAL	VR5 VR6	X68-1480	<p>Connect an oscilloscope calibrated for 100 MHz band to the CAL terminal and set VOLTS/DIV to 0.2 V and TIME/DIV to 0.1 ms. Adjust VR5 so that one cycle is 1 ms (i.e. 10 divisions). Adjust VR6 so that the amplitude is 1 V (i.e. 5 divisions).</p>

8. Cursor Section Adjustments

Item	Adjustment	PCB	Procedure
Cursor Y Gain	VR3	X80-1090	<p>CURSORS : ΔY1 Δ : Turn clockwise until the cursor stops at the top of the screen. ΔREF : Turn counterclockwise until the cursor stops at the bottom of the screen. CH1 VOLTS/DIV : 10 mV * Adjust VR3 so that the interval between the cursors is 8 divisions. Move the cursor in Y direction using VR4 so that VR3 can be adjusted easily.</p>
Cursor Y Position	VR4	X80-1090	<p>CURSORS : ΔV1 Δ : Turn clockwise until the cursor stops at the top of the screen. ΔREF : Turn counterclockwise until the cursor stops at the bottom of the screen. * Adjust VR4 to align two horizontal cursors with the uppermost and lowest scales on the screen respectively.</p>
Cursor X Gain and Position	VR10 VR11	X80-1090	<p>CURSORS : ΔV1 Δ : Turn clockwise until the cursor stops at the right end of the screen. ΔREF : Turn counterclockwise until the cursor stops at the left end of the screen. * Adjust VR11 so that the interval between the cursors is 10 divisions. Move the cursor in X direction using VR10 so that VR10 can be adjusted easily. * Adjust VR10 to align two vertical cursors with the right end and left end scales on the screen respectively.</p>

ADJUSTMENT

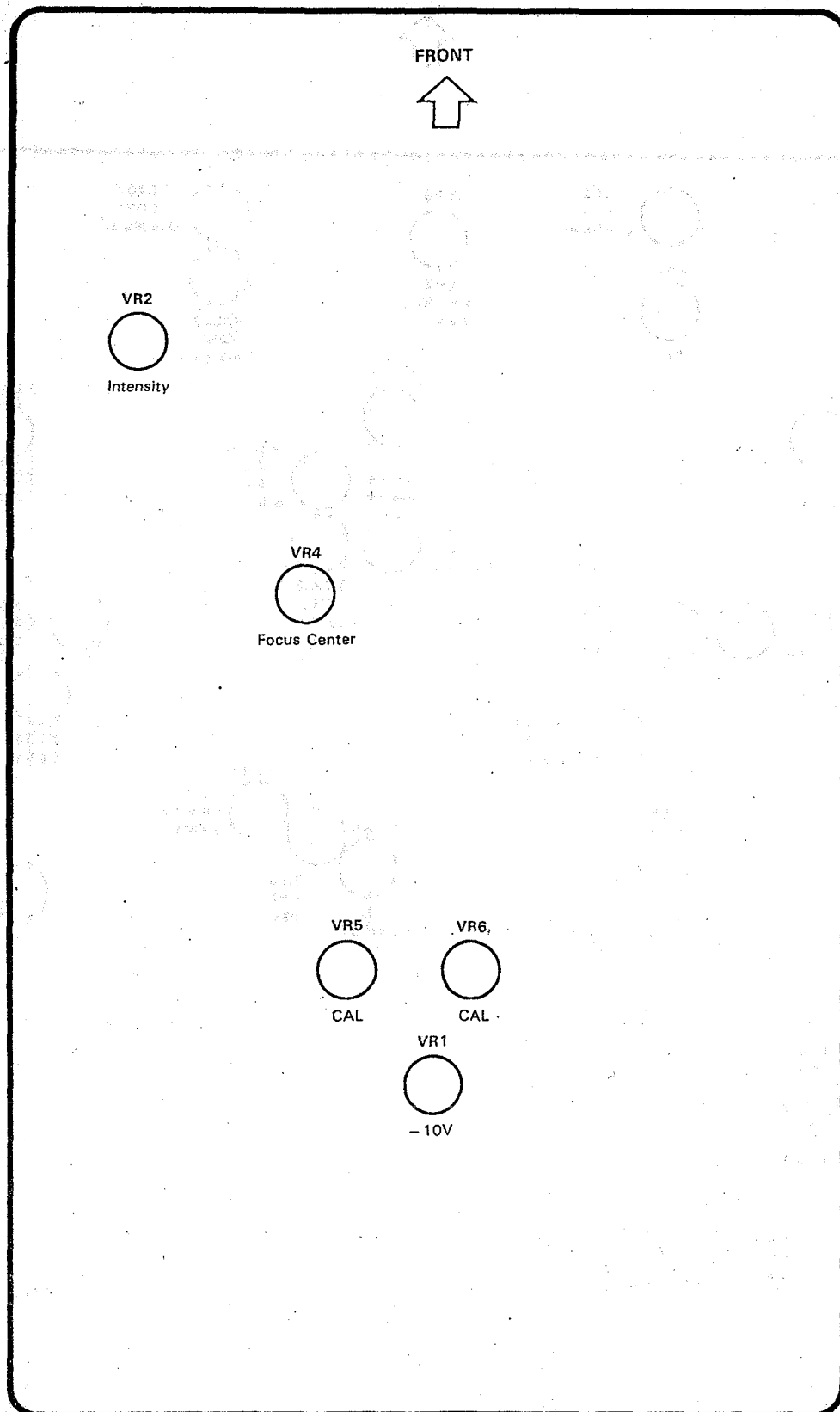
9. PLOT system

Item	Adjustment	PCB	Procedure
X Gain	VR14	X78-1080	AC-GND-DC : GND SWEEP TIME/DIV : 10 μ s * In NORM mode, turn CH1 POSITION fully clockwise. Then change the mode to HOLD mode, press the PLOT KEY and adjust VR14 to give +5 V at terminal X of PEN OUT in the rear side.
Y Gain	VR16	X78-1080	AC-GND-DC : GND SWEEP TIME/DIV : 10 μ s * In NORM mode, turn CH2 POSITION fully clockwise. Then change the mode to HOLD. X-Y mode, press the PLOT KEY and adjust VR16 to give +5 V at terminal Y of PEN OUT in the rear side.

ADJUSTMENT

POWER SUPPLY UNIT (X68-1480-01)

Pattern side view

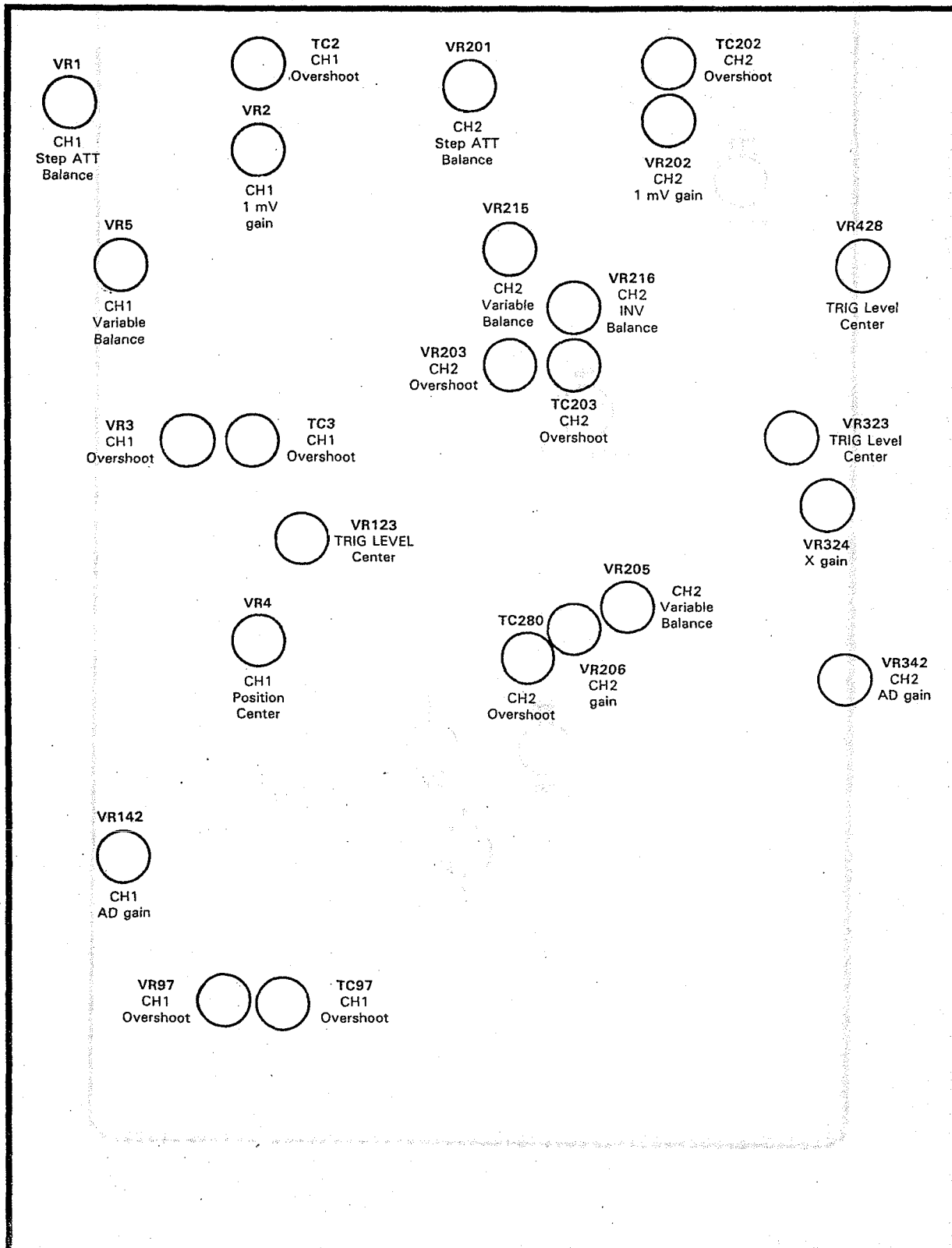


ADJUSTMENT

PRE AMP UNIT (X73-1930-00)

FRONT

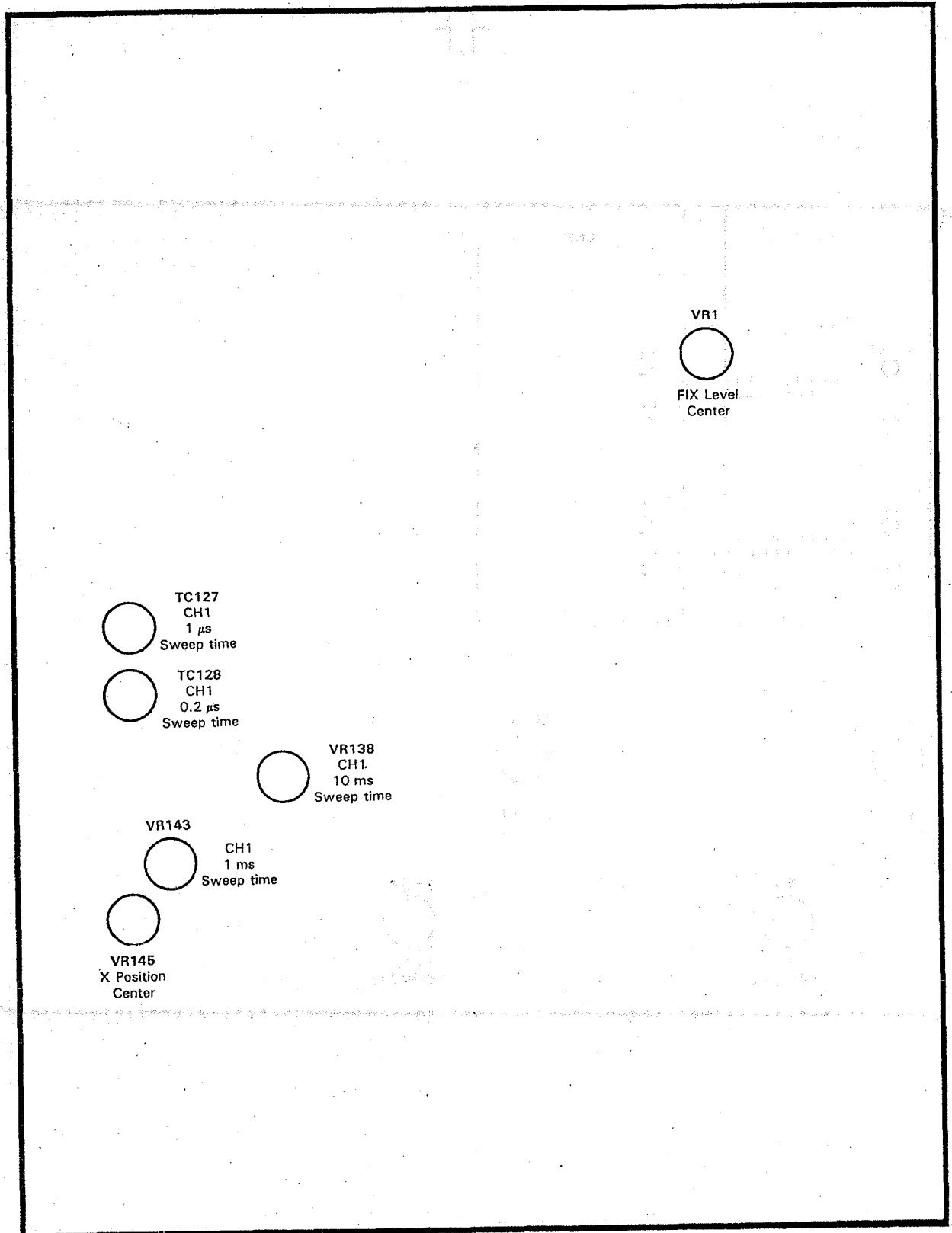
Pattern side view



ADJUSTMENT

HORIZONTAL UNIT (X74-1550-00)

Pattern side view

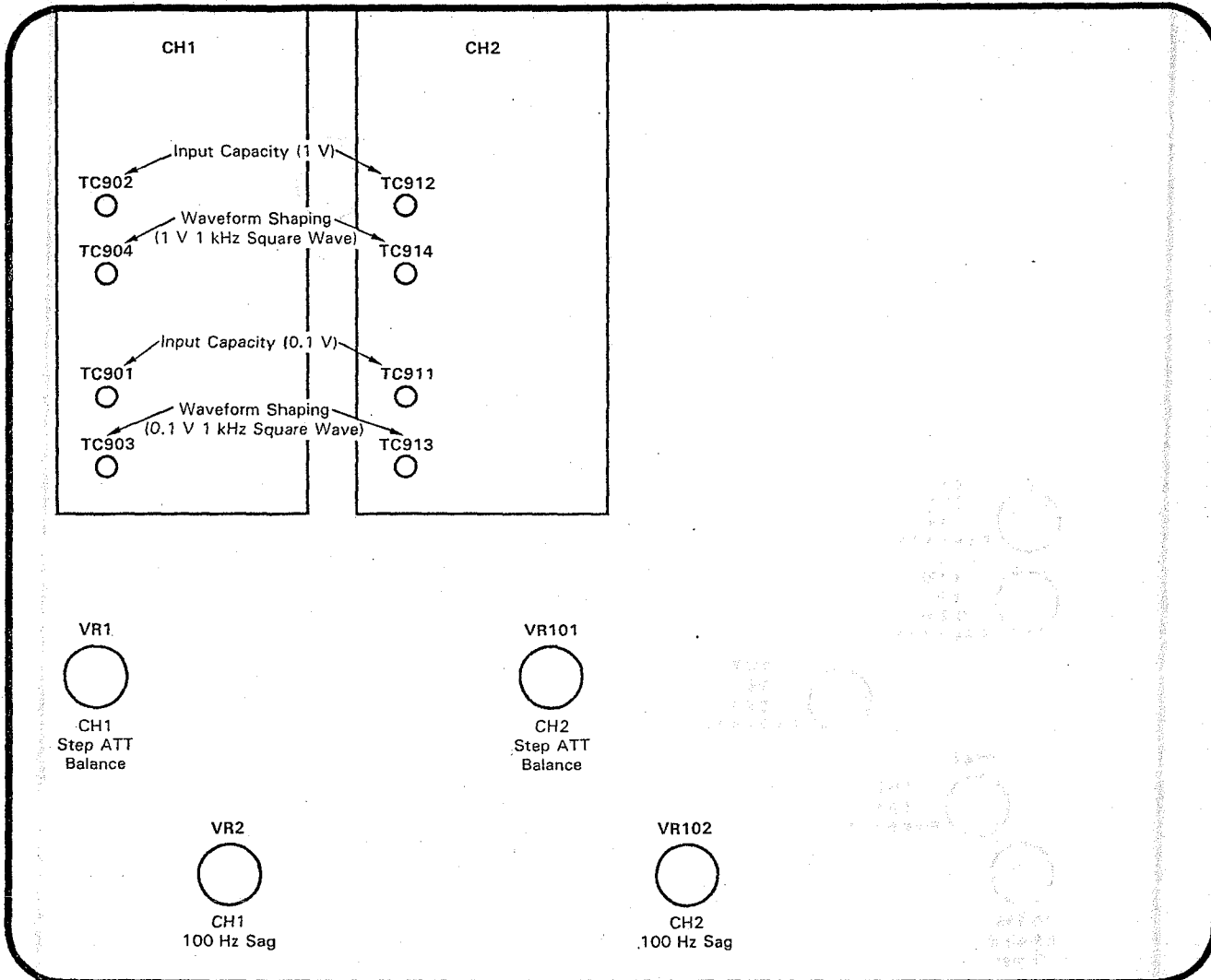


FRONT

ADJUSTMENT

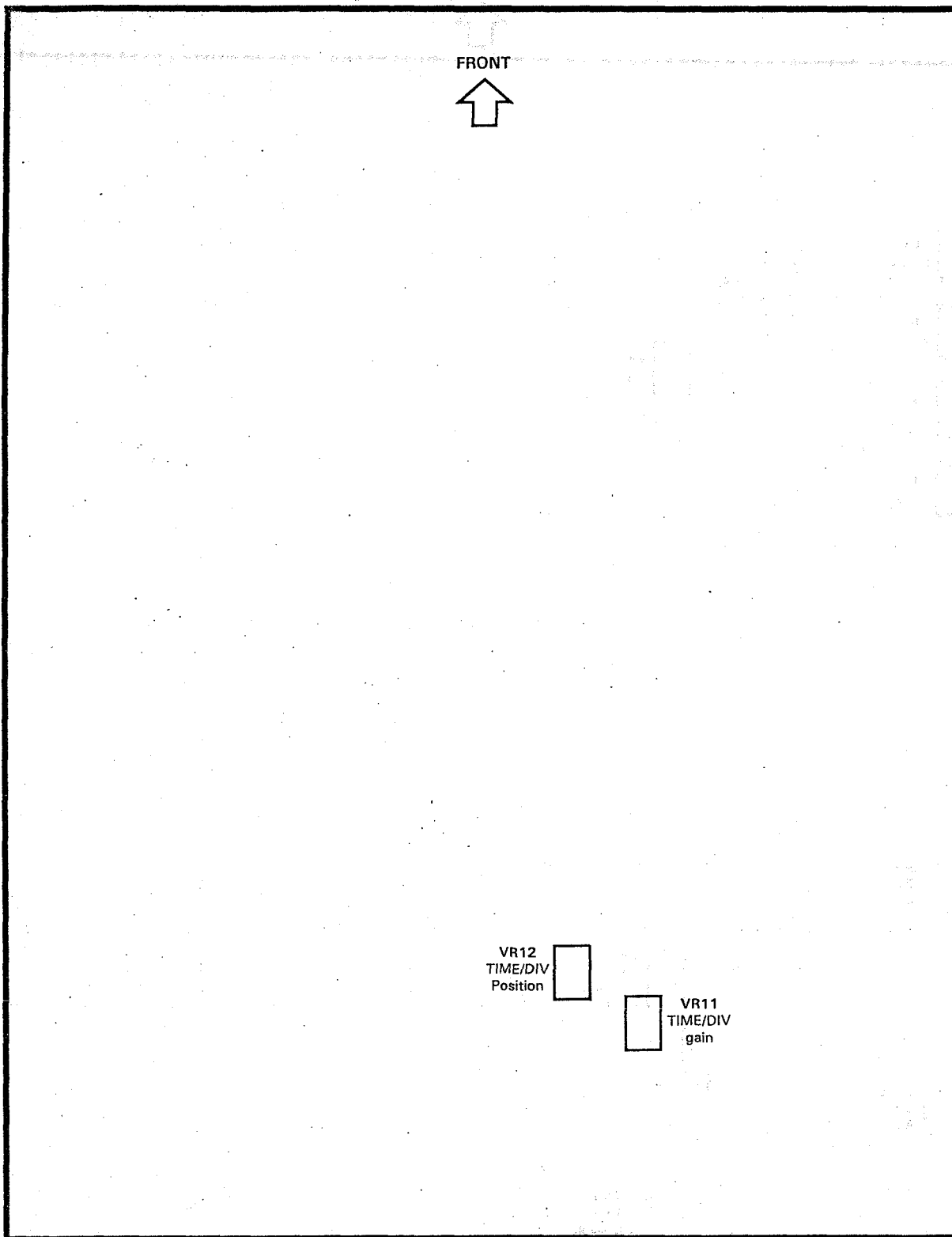
ATT UNIT (X75-1200-00)

FRONT



ADJUSTMENT

STORAGE UNIT (X77-1730-00)



ADJUSTMENT

A/D CONVERTER UNIT (X78-1080-00)

FRONT



VR8
X Position

VR7
X Gain

VR14
X Gain
VR16
Y Gain
PLOT

VR5
Y Gain

VR6
Y Position

VR63
CH1
AD Position

VR69
CH2
AD Position

VR601
CH1
EQU Mode
Position

VR602
CH1
EQU Mode
Gain

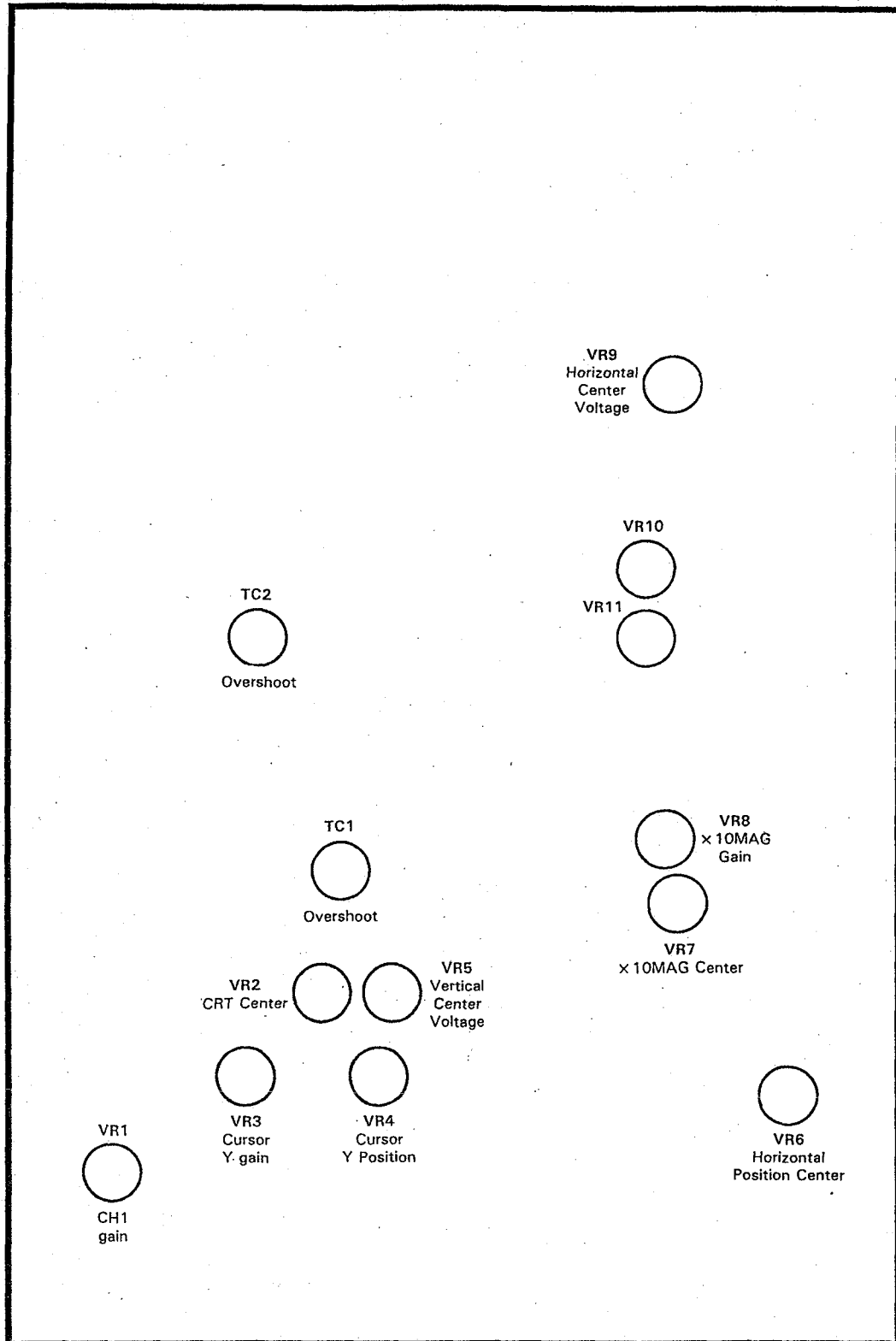
VR701
CH2
EQU Mode
Position

VR702
CH2
EQU Mode
Gain

ADJUSTMENT

FINAL UNIT (X80-1090-02)

Pattern side view



FRONT